



Global Environment Facility

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June 3, 2008

Dear Council Member:

The World Bank as the Implementing Agency for the project entitled ***Jordan: Promotion of a Wind Power Market*** has submitted the attached proposed project document for CEO endorsement prior to final Agency approval of the project document in accordance with the World Bank procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in June 2006 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the World Bank satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Barbut", with a long horizontal line extending to the right.

Attachment: Project Document

cc: Alternates, GEF Agencies, STAP, Trustee



REQUEST FOR CEO ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project
THE GEF TRUST FUND

Submission Date:
Re-submission Date:

PART I: PROJECT INFORMATION

GEFSEC PROJECT ID:

GEF AGENCY PROJECT ID: P093201

COUNTRY(IES): Jordan

PROJECT TITLE: Promotion of a Wind Power Market Project

GEF AGENCY(IES): World Bank,

OTHER EXECUTING PARTNER(S):

GEF FOCAL AREA(S): Climate Change

GEF-4 STRATEGIC PROGRAM(S): Promoting market approaches for renewable energy.

NAME OF PARENT PROGRAM/UMBRELLA PROJECT:

Expected Calendar	
Milestones	Dates
Work Program (for FSP)	June 2006
GEF Agency Approval	June 2008
Implementation Start	August 2008
Mid-term Review (if planned)	Dec 2009
Implementation Completion	June 2011

A. PROJECT FRAMEWORK (Expand table as necessary)

Project Objective: Increase power supplied from renewable energy sources in a sustainable manner through the private sector and help reduce the level of carbon emissions from hydrocarbon-based power generation sources.								
Project Components	Indicate whether Investment, TA, or STA**	Expected Outcomes	Expected Outputs	GEF Financing*		Co-financing*		Total (\$)
				(\$)	%	(\$)	%	
1. Development of a Promotional Wind IPP Power Plant	(i) Investment by private investors under a build-own-operate (BOO) concession. (ii) TA in the design of wind power plant and the selection of investors.	Carbon savings from wind power.	Commercial operation of a 60-70 MW wind farm.	1,000,000	16.7%	130,000,000	95.7%	131,000,000

2. Support for Jordan Renewable Energy and Energy Efficiency Fund	Investment via an output-based subsidy through a renewable energy fund -- Jordan Renewable Energy and Energy Efficiency Fund (Jordan REEF).	Financing support for wind power investments.	Creation of a renewable energy fund - Jordan Renewable Energy and Energy Efficiency Fund (Jordan REEF).	3,400,000	56.7%	3,500,000	2.6%	6,900,000
3. Technical assistance	TA	Removal of barriers to wind energy development	Passage of renewable energy law; addition of wind power to Jordan's power system.	1,400,000	23.3%	1,000,000	0.7%	2,400,000
4. Project management / Project development support / Development of a market for renewable energy				200,000	3.3%	1,400,000	1.0%	1,600,000
5. Contingency***						1,100,000		
Total Project Costs				6,000,000		135,900,000		141,900,000

* List the \$ by project components. The percentage is the share of GEF and Co-financing respectively to the total amount for the component.

** TA = Technical Assistance; STA = Scientific & technical analysis.

*** This contingency (US\$1.1 million) is committed by the Government of Jordan in addition to the government's counterpart financing committed to the Project (US\$5.9 million). This contingency amount is therefore not included in the total project costs. For the record, however, the following table B indicates the government co-financing amount of US\$5.9 million for the Project and US\$7.0 million as the overall government co-financing at CEO endorsement.

B. FINANCING PLAN SUMMARY FOR THE PROJECT (\$)

	<i>Project Preparation*</i>	<i>Project</i>	<i>Agency Fee</i>	<i>Total at CEO Endorsement</i>	<i>For the record: Total at PIF</i>
GEF	350,000	6,000,000	571,500	6,921,500	10,350,000
Co-financing -- Government	20,000	5,900,000 ^a		7,000,000	20,000
Co-financing – Private sector	0	130,000,000 ^b	0	0	78,000,000
Total	370,000	141,900,000	571,500	13,921,500	88,370,000

a: This is the initial amount of government co-financing for the Project. To meet this obligation, the government plans to commit up to JD 5 million (US\$7 million) out of the annual Budget over the first three years of the Project, comprising of JD1.5 million for the year 2008, JD1.5 million for the year 2009 and JD2 million for the year 2010. The use of the government counterpart financing will be combined with the GEF grant and other funding sources (which is not part of the Project), and channeled through the Jordan REEF for Component 2. The use of the government counterpart financing will be combined with the GEF grant, managed by the Project Coordination Unit for Component 3 and 4.

b: This is the estimated cost that a private project developer will incur to develop a 60-70 MW wind power project. This cost estimate is based on the current high cost of wind power equipment and on commercial terms typical of this type of project. In parallel to the Project, the Government of Jordan has pre-qualified eight private project developers for the development of a 30-40 MW wind power project in Jordan. This reflects strong developers' interest for wind power project in Jordan at this moment.

* Please include the previously approved PDFs and PPG, if any. Indicate the amount already approved as footnote here and if the GEF funding is from GEF-3. Provide the status of implementation and use of fund for the project preparation grant in Annex D.

C. SOURCES OF CONFIRMED CO-FINANCING, including co-financing for project preparation for both the PDFs and PPG. (expand the table line items as necessary)

<i>Name of co-financier (source)</i>	<i>Classification</i>	<i>Type</i>	<i>Amount (\$)</i>	<i>%*</i>
Government co-financing	Nat'l Gov't	Grant	7,000,000	5.1%
Private sector co-financing	Private Sector	Hard-loan	[130,000,000]**	94.9%
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
	(select)	(select)		
Total Co-financing			137,000,000	100%

** Preparation for the selection of a private project developer is underway. The private sector co-financing will be confirmed following developer selection and is expected to comprise private equity and commercial loans.

** The Government of Jordan has committed to a JD5 million (US\$7 million) counterpart financing for the project, comprising of JD1.5 million for the year 2008, JD1.5 million for the year 2009 and JD2 million for the year 2010.

* Percentage of each co-financier's contribution at CEO endorsement to total co-financing.

D. GEF RESOURCES REQUESTED BY FOCAL AREA(S), AGENCY(IES) OR COUNTRY(IES)

<i>GEF Agency</i>	<i>Focal Area</i>	<i>Country Name/ Global</i>	<i>(in \$)</i>			
			<i>Project Preparation</i>	<i>Project</i>	<i>Agency Fee</i>	<i>Total</i>
(select)	(select)					
(select)	(select)					
(select)	(select)					
(select)	(select)					
(select)	(select)					
(select)	(select)					
Total GEF Resources						

* No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

E. PROJECT MANAGEMENT BUDGET/COST

<i>Cost Items</i>	<i>Total Estimated person weeks</i>	<i>GEF (\$)</i>	<i>Other sources (\$)</i>	<i>Project total (\$)</i>
<i>Local consultants*</i>	15	0	37,500	37,500
<i>International consultants*</i>	35	0	210,000	210,000
<i>Office facilities, equipment, vehicles and communications**</i>				
<i>Travel**</i>		63,000	5,625	68,625
Total	50	63,000	253,125	316,125

Note: Project management will be carried out by permanent staff of the Ministry of Energy and Mineral Resources and the Ministry of Planning and International Cooperation. No incremental payment will be made to these staff. 3

* Provide detailed information regarding the consultants in Annex C.

** Provide detailed information and justification for these line items. This is the estimated cost of travel and living expenses, which have not been included in the consultancy fees.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

<i>Component</i>	<i>Estimated person weeks</i>	<i>GEF(\$)</i>	<i>Other sources (\$)</i>	<i>Project total (\$)</i>
<i>Local consultants*</i>	20	0	50,000	50,000
<i>International consultants*</i>	308	1,997,500	242,500	2,240,000
<i>Reimbursable expenses</i>		579,500	100,000	679,500
Total	328	2,577,000	392,500	2,969,500

* Provide detailed information regarding the consultants in Annex C.

G. DESCRIBE THE BUDGETED M&E PLAN: The monitoring and evaluation of the project's outcome/results will be undertaken under a Results and Monitoring Framework. An independent party will be appointed to certify the outcome/results at mid-term and at project completion. M&E will be financed under the technical assistance component. US\$100,000 has been budgeted..

PART II: PROJECT JUSTIFICATION

A. DESCRIBE THE PROJECT RATIONALE AND THE EXPECTED MEASURABLE GLOBAL ENVIRONMENTAL BENEFITS:

The project focuses on barrier removals for the development of a wind power market in Jordan. The key barriers include limited access to commercial financing, shortfalls in the regulatory environment, and incorporating wind energy into Jordan's power system. The 60-70 MW promotional wind farm is estimated to save 1.8 million tons of carbon over the twenty-year operating period.

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL PRIORITIES/PLANS: The project is consistent with Jordan's target to have 7% of the country's energy mix to come from renewable sources by 2015, a goal committed as an endorsement of the outcome of the World Summit on Sustainable Development in Johannesburg in 2002. A significant proportion is expected to come from an estimated 600 MW of wind-based power.

C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS: The project contributes to the objectives of GEF's Operational Programs Number 6: Promoting the adoption of renewable energy by removing barriers and reducing implementation costs. The project would also address the objective of GEF Strategic Programs for GEF-4 financing for mitigation under the climate change focal area: Promoting market approaches for renewable energy.

D. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES: The Government of Japan provided funding through a PHRD grant to study various aspects of renewable energy development, resulting in preparation of a renewable energy development and utilization strategy and a renewable energy law. The GoJ will approach other bilateral financiers once the Jordan Renewable Energy and Energy Efficiency Fund (Jordan REEF) is in place. Financial contribution by other future financiers to the Jordan REEF is not linked to the requested GEF grant and the government counterpart financing.

E. DESCRIBE THE INCREMENTAL REASONING OF THE PROJECT: GEF support for the proposed project is critical for the following reasons: (i) the financial and technical/operational risks of grid-based wind energy are high, especially in a developing country context; (ii) the success of the proposed project is a critical step in the gradual but global approach for adapting and developing grid based wind energy on a large scale, for which GEF and Bank involvement would leverage technical knowledge and international best practice to ensure success; (iii) Jordan and the Middle Eastern region in general have a large potential market for grid-based wind energy – this project could support a region-wide initiative on grid-based wind energy; (iv) the potential for future cost reduction in grid based wind energy is high; and (v) GEF support will accelerate the dissemination of the technology and achieve substantial reduction in GHG emissions. Furthermore, grid-based wind energy may become a significant power source for countries with high wind potential, especially with the entry into force of the Clean Development Mechanism (CDM) of the Kyoto Protocol.

F. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED AND OUTLINE RISK MANAGEMENT MEASURES: Key risks include: (i) lack of political

commitment for renewable power. This risk is contained as evidenced in the Jordan National Energy Strategy targeting 7% of the energy mix to come from renewable energy and the Renewable Energy law being under parliamentary review and expected for approval in 2008; (ii) lack of follow-up wind project investment. This risk is mitigated through a proper design of the promotional wind farm and barrier removal activities for wind power projects ; (iii) high cost of wind power equipment. This risk is mitigated through a pass-through of the higher cost of wind power via electricity tariff adjustment; (iv) transmission company refuses to buy more expensive wind power. This risk is also mitigated through a pass-through of the higher cost via tariff adjustment; and (v) local financial market not willing to lend to wind power project. This risk is addressed via the establishment of a renewable energy fund -- Jordan Renewable Energy and Energy Efficiency Fund (Jordan REEF) -- as a champion for wind power project financing.

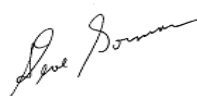
G. EXPLAIN HOW COST-EFFECTIVENESS IS REFLECTED IN THE PROJECT DESIGN: the development of a 60-70 MW promotional wind farm will be undertaken via international competitive bidding of private developers under a build-own-operate concession (BOO). Consultants selection for technical assistance will also be subject to competitive bidding.

PART III: INSTITUTIONAL COORDINATION AND SUPPORT

A. PROJECT IMPLEMENTATION ARRANGEMENT: The GoJ has established a project coordination unit (PCU) under the Department of Renewable Energy in the Ministry of Energy and Mineral Resources (MEMR). The PCU will be responsible for coordinating the project and consists of three key personnel: Project Coordinator, Procurement Officer, and a Financial Officer. The latter will be based in the Ministry of Planning and International Cooperation (MOPIC). In addition, other personnel, especially in MEMR’s directorate responsible for renewable energy, in MOPIC and in NEPCO, will assist the three members in various aspects of project coordination. The PCU will coordinate with other institutions involved in the project, such as the renewable energy fund, land owners, potential investors and the electricity regulator, among others, in preparation and procurement of the wind farm component and in implementation of the other components prior to establishment of the renewable energy fund. When established, the renewable energy fund will be responsible for the technical assistance and project development activities, and for providing performance-based subsidies to projects which require them. The PCU will be responsible for launching the RFP for the wind power BOO component on behalf of MEMR, and will administer the bidding and evaluation process. It will coordinate the technical assistance component and will be responsible for all fiduciary aspects.

PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF: The final project design is aligned with that at the work program entry. The main project components are maintained, including: (i) promotional wind IPP development; (ii) renewable energy financing (via a renewable energy fund); (iii) technical assistance to enable wind power development; and (iv) project development cost support.

PART V: AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for CEO Endorsement.	
 Steve Gorman GEF Agency Coordinator	Kanta Kumari Rigaud Project Contact Person
Date: 05/29/2008	Tel. and Email:1-202-473-4269 kkumari@worldbank.org

ANNEX A: PROJECT RESULTS FRAMEWORK

Results Framework

PDO / Global Environmental Objective	Project Outcome Indicators	Use of Project Outcome Information
Increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emissions from hydrocarbon-based power generation sources.	<ol style="list-style-type: none"> 1. Increased electricity supply from grid-connected renewable power (from 72 to 272 GWh) 2. Increased number of private developers of wind power (from 0 to one or more) 3. Avoided CO₂ emissions increased by 112,500 ton per year). 4. Reduced levelized cost offered by bidders of real 6-7 US cents based on 2003 prices. 5. A fund for renewable energy fully operational by the second year. 	Measure success in achieving overall Project Development and Global Environmental objectives
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring
Risk and cost barriers for independent wind power development removed.	<ol style="list-style-type: none"> 1. Incremental changes to policy and regulatory framework (IPP approval process; tariff approval) implemented. 2. A financing mechanism, including performance-based incentives and tariff to help mitigate incremental costs in place. 	Assess extent to which policy and regulatory barriers and lack of financial incentives have been removed
Sufficient information and knowledge on wind power development.	<ol style="list-style-type: none"> 1. Information prepared and disseminated to stakeholders. 2. Wind power properly integrated in power system operation. 	Assess extent to which the knowledge barrier has been removed
Begin to develop a commercial IPP wind power industry.	60-70 MW of wind power IPPs operational.	Gauge market interest in wind power development
Provide support to project developers	Prospective developers supported	Gauge success of support scheme

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF)

a) **COUNCIL**

Comments were received from the German and the French council members. The German council member supported the project with no comment, while the latter raised some specific issues which are addressed below.

Comment: demonstration of incremental costs and the use of GEF contribution. The demonstrated incremental costs are oversized due to the use of lower natural gas prices and higher O&M cost for wind farm. The incremental cost might be lower than quoted in project document reducing therefore the need for subsidies.

Response: The promotional wind IPP project's incremental cost was updated at appraisal to be US\$6.3 million. The details of the main assumptions are as follows:

First, the economic capital cost of the Baseline was increased from US\$850/kW to US\$1,250/kW. This reflected the general rise in power equipment cost worldwide. In parallel, the cost for the wind IPP was increased from US\$1,300/kW to US\$1,813/kW.

Second, the cost of natural gas for the Baseline was increased from US\$3.4/MMBtu to US\$4.0/MMBtu. The revised cost is in accordance with the updated Jordan's National Energy Strategy, which substantially reflects the contractual cost of imported gas from Egypt. Although this cost of gas remains below international price level, it reflects the economic cost of gas to Jordan.

Third, the fixed and variable O&M unit costs for both the Baseline and the wind IPP were kept unchanged. The 1.25 US cents/kWh variable O&M unit cost for a wind farm already reflected efficiency gained from prior projects worldwide.

The revised incremental cost will be partially met by the proposed GEF grant, the GoJ's contribution, and tariff increases. The remaining balance of the proposed GEF grant is earmarked towards the technical assistance and project development support components of the overall Promotion of a Wind Power Market project.

Comment: Project organization. It might be interesting to give a higher role to the NEPCO grid utility to facilitate its involvement in subsequent stages and capitalize project experience.

The project's institutional and implementation arrangements were updated at appraisal. NEPCO is now involved in the early stage of the project, which will include providing technical support to the to-be-established Project Coordination Unit. NEPCO will also benefit from the technical assistance component in building NEPCO's capacity to incorporate wind power to the grid.

b) **STAP reviewer**

Issue: Scientific and Technical Soundness. The wind resource may not produce a 39 or 40 percent net capacity factor mentioned in the Project Description.

Response: The wind speeds in the proposed project area (between the Gulf of Aqaba and the Dead Sea) are in the order of 8 m/s, with wind power densities above 220W/m² and harvestable energy above 2W/m². Measurements at Fujei were taken at 50m. This notwithstanding, further wind resource measurements are being carried out, both in the originally selected areas as well as other parts of the country, and at the appropriate height. This information will be available at the time of bidding.

Issue: Adequacy of Financing Mechanism. Competitive bidding at the beginning of renewable development is not conducive to building a renewable energy industry within the country (if Jordan has this as one of their long-term goals). This competitive bid will tend to attract international companies that already have experience with building

wind farms in other regions of the world. ...Jordan may have too small of a domestic electricity load to justify local manufacturing.

Response: The team agrees that the Jordanian electricity market is currently too small to justify local manufacturing. With potential for wind power in neighboring countries such as Lebanon and Egypt and demand growth in Jordan, local manufacturing for the regional market could be justified in the future.

Issue: Other Financial Analysis Assumptions. It is important that not only the wind data but the cost data for the baseline plant be revised so the comparisons are based on the latest information at the time of project appraisal and decision makers are able to accurately compare the costs and benefits of renewables with those of the alternative.

Response: Assumptions for both the wind and the baseline have been updated.

Issue: Other Financial Analysis Assumptions. The CCGT Average Electricity price numbers used in the incremental cost evaluation (Annex 15, page 46) look like they may be based on \$3 to \$4/million natural gas prices not likely to be seen again in the gas market in the near future. Moreover, the 35.3 percent efficiency of the gas turbine (Annex 15, page 45) may not be realistic for a 60 MW CCGT. Larger facilities operate at this level but smaller ones are often less efficient. This reassessment may well result in a more favorable financial scenario for the wind facilities than shown in the project appraisal document (even with a slightly downward adjustment in the capacity factor for the wind project).

Response: The gas price is indeed \$3.4 per mMBTU (information provided after review – see Annex 15). This is higher than the current price of US\$2.9 but the team agrees it could still be below the economic value (Annex 15). Following appraisal, the gas price was increased to US\$4.0 per MMBTU as per the December 2007 updated National Energy Strategy. It should be noted that a much larger capacity than 60 MW would normally be installed, and it would have the characteristics used in the analysis. It is therefore reasonable to scale down only the capital and operational costs; not the efficiency.

Issue: Transmission Issues. There should not be any insurmountable technical issues associated with integrating this level of wind generation into the grid, however many transmission operators are wary of adding intermittent wind capacity because they have had no experience with it and fear it will disrupt system operations. A significant amount of education and hand holding may be required before the system operator feels comfortable with interconnecting these projects.

Response: The team agrees. The issue of integration of wind energy in grid supply is being tackled in two phases. First, agreement is being sought from the Single Buyer, NEPCO, the Electricity Regulatory Commission and the Ministry of Energy and Mineral Resources on a wind energy premium in the tariff. This is expected prior to appraisal. During the project, the TA component will assist NEPCO with the necessary tools and training for the inclusion of wind energy in its power generation planning. This will enable NEPCO to assess the value of wind-based power supply, and thereby provide the basis for a suitable tariff/ premium.

Issue: Stakeholder Participation. Stakeholder participation is easy to say and hard to do. This reviewer encourages the project managers to recognize this from the start and not be discouraged when they find stakeholder participation is contrary to efficient decision making.

Response: The team agrees and will pay particular attention to this aspect. The TA component provides for this.

c) UNDP Comments

Comment: Apart from the proposed 1.5 US cent per kWh production subsidy requested from the GEF, neither a strong commitment nor an expression of interest by the envisaged project partners to financially support the suggested 60MW wind farm (by a premium feed-in tariff or otherwise) seems to be in place yet. The project claims to create the required conditions to leverage this financing and other required support during project implementation, which, however, is associated with a high risk of failure. These concerns are strengthened by the experiences and challenges faced by the somewhat similar UNDP project in Tunisia and WB project in Egypt.

Response: Agreement was reached that most of the incremental cost will be absorbed by the average bulk tariff from all sources of supply.

Comment: Reaching an agreement with NEPCO / Government of Jordan on a power purchasing price, which would be attractive enough for the targeted private investors is obviously a key to the success of the project. The cash flow analysis has been made with an assumed power purchasing price of 6.8 US cents per kWh (including a 1.5 US cent GEF subsidy), but there is no evidence about the readiness of NEPCO to sign such a PPA.

Response: The updated analysis shows an even higher value and there is now commitment from the government and NEPCO to pay this cost.

Comment: In general, there is a question about the adequacy of the support and interest that the project can show at this stage to facilitate GEF approval, as some recently submitted UNDP projects with a similar arrangement to leverage co-financing during the project implementation were rejected, because this strategy was not considered to be adequate to meet the GEF requirements.

Response: The issue with the previous bids was the fact that NEPCO and the government were not willing to pay the higher cost of wind power compared to the counterfactual source – natural gas. This was following the receipt of several bids for two proposed sites. The levelized tariffs then (2004) were in the range of 6.5 to 8.6 cents. Similar interest is expected this time around, albeit the levelized tariff will be higher, and the government and NEPCO are willing to accept the higher tariffs. The project is in line with the government's strategy for achieving 7% of energy supply from renewable sources by 2015 and wind power is the lowest-cost option for achieving this target.

d) GEF Secretariat

Comment: Component 2 -- the details of the operation of the financing mechanism and the contribution of different stakeholders into this fund should be further developed before the disbursement of the GEF funding.

Response: The Government of Jordan has committed to a JD5 million (US\$ 7 million) counterpart financing for the project, comprising JD1.5 million for the year 2008, JD1.5 million for the year 2009 and JD2 million for the year 2010. Part of this government counterpart financing will be injected into the Jordan REEF for further disbursement as per the Operating Manual of the Jordan REEF. Contribution of other stakeholders is not linked to the requested GEF grant and the government counterpart financing. Annex 4 of the GEF Project Brief is now expanded to include a description of the Jordan REEF and the associated financing mechanism in more details. The Operating Manual of the Jordan REEF is available in the project file.

Comment: Component 4 -- this component includes 3 sub-components, whose budget participation should be clarified. Also project development support nature should be clarified (grants or loans). How is this choice linked with market development?

Response: Annex 4 of the GEF Project Brief, supplemented by Annex 5, has been expanded to elaborate on the use of the \$0.2 million (out of \$6 million) GEF grant for Component 4.

Component: Clarity of the envisaged operation of the financing mechanism is crucial for the project success. However the project misses this clarity.

Response: The GEF grant and GoJ counterpart financing will be used for technical assistance and for supporting the Jordan REEF. This is elaborated in Annex 4 and 5 of the GEF Project Brief. In addition, the Jordan REEF Operating Manual provides initial details on funding disbursement. The Project Coordination Unit and Jordan REEF fund managers will be responsible for adopting the Jordan REEF Operating Manual and adjusting it per business needs.

Comment: The project should develop a renewable energy support framework which should be transparent and solid in

order to attract private investments. However, it is not clear how the project outcomes are linked with regulatory measures and the installation of a transparent grant/subsidy scheme.

Respond: The Jordan Renewable Energy Promotion Law will have to be enacted prior to the disbursement of the subsidy component (\$3 million) of the GEF grant. The draft Renewable Energy Promotion Law provides the policy framework that supports renewable energy activities in Jordan. The law permits the granting of renewable energy source certification. It allows the tariff for renewable energy to be governed by power purchase agreements, following competitive bidding of a project developer and allowing for indexation of variable costs. The law provides investment incentives in the form of income tax holidays, waiver of stamp duties, free use of public lands, and free cost of interconnecting to the electricity grid. The law also provides for the establishment of a fund to champion renewable energy activities (and energy efficiency activities): the Jordan Renewable Energy and Energy Efficiency Fund “Jordan REEF”. All future renewable energy projects, including the promotional wind power plant (Component 1), will be subject to transparent competitive bidding process. The Jordan REEF has been designed as an independent entity to promote renewable energy projects, including the financing of renewable energy projects. The Jordan REEF will be established in accordance with the Jordan Renewable Energy Promotion Law, having an independent board of directors and professional fund managers. The Jordan REEF will be subject to annual audit. The description of the policy framework under the Renewable Energy Promotion Law is now expanded in the GEF Project Brief.

Comment: Indicators are mainly relevant to the investment component. More detailed indicators as well as M&E policy should be described concerning the other components. Also the description of CO2 reduction outcomes (direct and indirect) should be refined.

Respond: The GEF Project Brief and Annex 3 have been amended to incorporate this comment. The description of CO2 reduction outcomes (direct and indirect) is now included at the end of Annex 3.

Comment: Clarify the exact allocation of governmental grants for each component through time.

Respond: The Government of Jordan has committed to a JD5 million (US\$ 7 million) counterpart financing for the project, comprising JD1.5 million for the year 2008, JD1.5 million for the year 2009 and JD2 million for the year 2010. The use of the government counterpart financing will be combined with the GEF grant and other funding sources (not part of the project), and channeled through the Jordan REEF for Component 2. The use of the government counterpart financing will be combined with the GEF grant, managed by the Project Coordination Unit for Component 3 and 4. It is therefore not feasible to identify the exact allocation of government counterpart financing for each component through time at this time.

Comment: Agency Fee should equal to 9% of the 6.35 MUSD GEF financing. That means that it should be readjusted to 571,500 USD.

Respond: This has been adjusted.

ANNEX C: CONSULTANTS TO BE HIRED FOR THE PROJECT

<i>Position Titles</i>	<i>\$/ person week</i>	<i>Estimated person weeks</i>	<i>Tasks to be performed</i>
For Project Management			
Local			
Short-term coordinators	2500	15	Workshop facilitation
International			
Various experts	6000	35	As-required support to PMU staff
For Technical Assistance			
Local			
Monitoring and evaluation experts	2500	20	Project monitoring and evaluation
International			
Power system analysts	8000	40	Integrating wind power into the grid.
Policy and regulatory specialists	9000	30	Enhancement of policy and regulatory framework
Monitoring and evaluation expert	5000	8	Project monitoring and evaluation
Project Manager	8000	40	Support for development of promotional wind farm
Procurement Expert	6000	30	
Financial Analyst	6000	30	
Lagal and BOO Expert	9000	30	
Windpower Engineer	8000	30	
Business Development experts	6000	70	
			Development of business models for small scale renewable businesses and conducting business development activities

ANNEX D: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS

- A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.**
 (i) The consultancy for the development of institutional/operating arrangement for Jordan renewable energy fund and monitoring and evaluation was completed. This would allow the Jordan renewable energy fund to be set up and channel output-based subsidy to promotional wind IPP. (ii) The assessment of the potential environmental and social impacts associated with a wind farm to be located on land to the north-east of the town of Shawbak was completed. This assessment will be provided to the selected private sector developer as a background information for the preparation of the Environmental and Social Impact Assessment (EIA) for the project.
- B. DESCRIBE IF ANY FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION.** The successful operations of the renewable energy fund will depend substantially on the competence of the fund management team. The recruitment of the fund management team will be crucial and could directly affect project implementation performance.
- C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:**

		<i>GEF Amount (\$)</i>	
--	--	------------------------	--

		<i>Amount Approved</i>	<i>Amount Spent To- date</i>	<i>Amount Committed</i>	<i>Uncommitted Amount*</i>	
Consultancy for development of institutional/operating arrangement for Jordan renewable energy fund.	Completed	182,412.00	175,434.50	182,412.00	0	0
Consultancy for environmental and social assessment and resettlement framework	Completed	50,591.46	50,591.46	50,591.46 (contract value GBP 27,500)	0	0
Remaining balance	Completed	116,996.54	0	0	116,996.54	0
	(Select)					
	(Select)					
	(Select)					
	(Select)					
	(Select)					
Total		350,000	226,025.96	233,003.46	116,996.54	0

* Uncommitted amount should be returned to the GEF Trust Fund. Please indicate expected date of refund transaction to Trustee.

Document of
The World Bank

GEF PROJECT BRIEF
ON A
PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US\$6.00 MILLION
TO THE
HASHEMITE KINGDOM OF JORDAN
FOR A
PROMOTION OF A WIND POWER MARKET PROJECT

MAY 29, 2008

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CURRENCY EQUIVALENTS

(Exchange Rate Effective May 15, 2008)

Currency Unit = Jordanian Dinar (JD)

1 JD = US\$0.70900

1 US\$ = 1 JD 1.4104

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	Agence Francais de Developpement
Amman East	Amman East Power Plant Project
BOO	Build, Own, Operate
CEGCO	Central Electricity Generating Company
CF	Capacity Factor
DEWI	German Wind Energy Institute
DSM	Demand Side Management
EA	Environmental Assessment
EDCO	Electricity Distribution Company
EE	Energy Efficiency
EMP	Environmental Management Plan
EPC	Engineer, Procure, and Construct
ESMAP	Energy Sector Management Assistance Program
ERC	Electricity Regulatory Commission
EU	European Union
FLH	Full Load Hours
GEF	Global Environment Facility
GHG	Greenhouse Gas
GoJ	Government of Jordan
GWh	Gigawatt-hour
GTZ	German Agency for Technical Cooperation
HV	High Voltage
JEA	Jordan Electricity Authority
JEPCO	Jordanian Electric Power Company
JORDAN	Jordan Renewable Energy and Energy Efficiency Fund
REEF	
IPP	Independent Power Producer
IDECO	Irbid District Electricity Company
kW	Kilowatt
kWh	Kilowatt-hour
LV	Low Voltage
MEMR	Ministry of Energy and Mineral Resources
MoF	Ministry of Finance
MOPIC	Ministry of Planning and International Cooperation
m/s	Meters per second
MV	Medium Voltage
MW	Megawatt
NEPCO	National Electric Power Company
NREC	National Energy Research Center
O&M	Operation and Maintenance
PHRD	Poverty and Human Resources Development
PCU	Project Coordination Unit
RAP	Resettlement Action Plan
RE	Renewable Energy
RET	Renewable Energy Technology
RISO	Riso National Laboratories, Denmark

Samra Samra Electric Power Generating Company
UNDP United Nations Development Program
UNFCCC United Nations Framework Convention on Climate Change
USTDA United States Trade Development Agency
WEC Wind Energy Converter
WSSD World Summit on Sustainable Development

Vice President:	Daniela Gressani
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JORDAN
PROMOTION OF A WIND POWER MARKET

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A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

Although Jordan graduated from a continuous stream of IMF programs in July 2004, the country remains significantly dependent on external financial flows both in the form of public grants and remittances from Jordanians working abroad. In 2006 these stood at 3% and 20% of GDP, respectively. Both sources of funding are volatile and uncertain. Without foreign grants the country faces a fiscal deficit, which had declined to about 7% of GDP (2006) from 10% (2005) and 12% (2004).

To reduce this deficit and address the priority issues of poverty reduction (currently at around 14%) and job creation, the Government of Jordan (GoJ) sees the need to create an environment conducive to private investment, by establishing a good investment regime, strengthening fiscal stability, building human resources and ensuring sustainability. Good progress has been achieved so far as evidenced in a notable increase in foreign direct investment, including privatization proceeds, to 22% of GDP (2006) up from 13% (2005) and 3% (2004).

Specific to the power sector, the first independent power producer (IPP), Amman East Power Plant, successfully raised US\$300 million of private capital (comprising US\$75 million in private equity and US\$225 million in loans, of which US\$45 million was covered by an IBRD Partial Risk Guarantee). Furthermore, the privatization of CEGCO, the main electricity generation company, was concluded in October 2007 and saw 51% of the company shares sold to private investors. A continuation of private investment in the sector would further alleviate direct pressure on Jordan's fiscal position, given the large investment capital needed.

On energy supply, GoJ moved to lift prices of domestic fuels as the twin pressures of high international oil prices and the ending of the Saudi Arabian oil supply agreement in April 2005 became fiscally unbearable and a major contributor to the fiscal deficit. As part of a decade-long structural reform of its economy, Jordan has sought to diversify its fuel mix and supply sources in order to reduce dependence on imports and use of oil, and mitigate adverse balance of payments situations and negative environmental impacts. Increasing the share of natural gas significantly, promoting renewable energy sources (wind, solar, biogas and geothermal), and energy use efficiency are the three principal means through which the GoJ seeks to achieve a more sustainable energy balance in the future.

The GoJ has recently updated its Energy Strategy and the new strategy sets a target of 7% of the country's energy mix to come from renewable sources by 2015, out of which a significant proportion is expected to come from an estimated 600MW of wind-based power supply. However, with a larger estimated potential for wind power in Jordan than originally anticipated as well as cost reduction as experience increases¹, wind and other renewables could contribute a more significant proportion of power supply over the long term. The implementation of wind

power projects would produce significant economic and environmental benefits as fuel oil and natural gas could be diverted to higher value use.

To achieve the 7% target, the GoJ has initiated a number of activities in research, training, measurements, feasibility studies and pilot projects with the support of bilateral and multilateral organizations like GTZ, UNDP, etc. Significant experience has, as a result, been gathered in solar heating (15% of households use solar water heaters) and cooling applications, water pumping, photovoltaics for communications, etc. A recent Japanese PHRD grant, administered by the Bank, supported resource assessment in renewable energy (wind, geothermal energy, etc.), including the design of a legal and regulatory framework which resulted in the draft Renewable Energy law. Through these activities, the government has demonstrated a strong commitment to promoting renewable energy sources as an energy option for the country. This project aims to help the government achieve its 7% target in a sustainable manner.

The draft Renewable Energy Promotion Law provides the policy framework that supports renewable energy activities in Jordan. The law permits the granting of renewable energy source certification. It allows the tariff for renewable energy to be governed by power purchase agreements, following competitive bidding of a project developer and allowing for indexation of variable costs. The law provides investment incentives in the form of income tax holidays, waiver of stamp duties, free use of public lands, and free cost of interconnecting to the electricity grid. The law also provides for the establishment of a fund to champion renewable energy activities (and energy efficiency activities): the Jordan Renewable Energy and Energy Efficiency Fund "JORDAN REEF".

The project would support Pillar 1 of the current Country Assistance Strategy (CAS) by assisting to reduce the perceived risk of the investment environment, and initiating diversification of energy supply through output-based private sector involvement.

The project would also indirectly address the GEF Strategic Objective 4: Increased production of renewable energy in electricity grids. The present project will be partly funded by local sources as well as by foreign private capital. The successful execution of the project would generate confidence among local financial institutions regarding renewable energy projects. It would also provide a model for private sector involvement in wind power in the region. The capacity building activities for government agencies, financial intermediaries and other stakeholders provided for under the technical assistance component would enhance the stakeholders' awareness and ability to analyze renewable energy proposals. The project is therefore expected to lead to increased involvement of the local financial sector in renewable energy development.

2. Rationale for GEF Involvement

The main objective of this project is to help create a sustainable wind power market in Jordan by overcoming barriers to the promotion of wind power. The barriers include limited access to commercial financing, shortfalls in the regulatory environment, and lack of knowledge in various aspects of renewable energy development in general, and wind energy development in particular. This project seeks GEF funding to meet the incremental cost of promoting a renewable energy

technology as an alternative to the baseline of natural gas-based power generation. This would comprise technical assistance for barrier removal, assistance in developing wind energy projects as well as a performance-based subsidy/grant for the promotional wind power projects and other renewable energy projects. A combination of a performance-based subsidy/grant and interventions in barrier removal are expected to leverage private sector funding and pave the way for favorable market conditions to scale up wind power in Jordan. Development of the renewable energy industry, with a target of 600 MW of wind-based power supply by 2015, together with other renewable sources, will contribute to reducing Jordan import-dependency, with implications for the country's energy security.

The proposed promotional investment will directly contribute to the supply of clean energy to the national power grid to the extent of about 200 GWh annually over a period of 20 years. It will contribute to reduction of fuel oil imports by about 162 Ktoe of crude oil every year. Furthermore, it will help mitigate investor risk and bridge the knowledge gap to ensure sustainability and replicability.

At the global level, the promotional investment will contribute to reduction of greenhouse gas emissions to the extent of 1.8 million tons of CO₂-equivalent over the life of the project. It will also contribute to the process of sustainable development by offering several socio-economic benefits to the country in the form of development of indigenous industry, local capacity building and employment generation. By contributing to increased diversity of fuel options, the project contributes to GoJ's mandate which gives high priority to a sustained efficient development of the energy sector to enhance economic competitiveness as the country transitions into a services-oriented economy.

The project contributes directly to the goal of increasing the share of renewables to 7% of the energy mix by the year 2015, a goal committed to by the GoJ as an endorsement of the outcome of the World Summit on Sustainable Development in Johannesburg in 2002.

Given its strategic importance, the GoJ has attached high priority to the project. The proposed GEF grant assistance is thus a critical input towards supporting this project in order to bring down the cost of wind and other renewable energy and thus begin to tap the large wind power potential in the country. The GoJ has taken important steps to improve the performance of the sector through regulation, restructuring, private sector participation and development of the use of renewable energy. The proposed project would address key issues in the government strategy such as increasing institutional capacity and contribution of renewable energy to the overall energy mix.

This operation is consistent with, and supportive of, national development priorities as well as internationally agreed programs of action for sustainable development. It lays down the framework necessary for the development of a sustainable wind market in Jordan, the implementation of which would lead to: (i) transfer of technology that is environmentally sound, adapted to suit local conditions and is cost-effective; and (ii) important global benefits in terms of reduction of greenhouse gas (GHG) emissions, and contribute directly to the objectives

of Strategic Program for GEF-4 Financing for Mitigation under the Climate Change Focal Area: “Promoting market approaches for renewable energy”.

GEF support for the proposed project is critical for the following reasons: (i) the financial and technical/operational risks of grid-based wind energy are high, especially in a developing country context; (ii) the success of the proposed project is a critical step in the gradual but global approach for adapting and developing grid based wind energy on a large scale, for which GEF and Bank involvement would leverage technical knowledge and international best practice to ensure success; (iii) Jordan and the Middle Eastern region in general have a large potential market for grid-based wind energy – this project could support a region-wide initiative on grid-based wind energy; (iv) the potential for future cost reduction in grid based wind energy is high; and (v) GEF support will accelerate the dissemination of the technology and achieve substantial reduction in GHG emissions. Furthermore, grid-based wind energy may become a significant power source for countries with high wind potential, especially with the entry into force of the Clean Development Mechanism (CDM) of the Kyoto Protocol.

3. Higher level objective to which the project contributes

The project aims to help create a sustainable renewable energy market in Jordan and contribute to reducing greenhouse gas emissions. The project would contribute to the GoJ's objective to supply 7% of the country's energy mix from renewable sources by 2015.

In order to achieve these results, the project aims to do the following:

Pass renewable energy legislation. The activity commenced during project preparation and is close to completion. The draft legislation includes establishment of a dedicated institution for renewable energy promotion and development, the JORDAN REEF. Passing of this legislation addresses the key barriers of not having a suitable policy and regulatory framework. Passing of subsidiary legislation is envisaged during the project.

Establish an institution for renewable energy development. The JORDAN REEF would spearhead renewable energy development (and energy efficiency), with the purpose of achieving the above outcomes in a sustainable manner. The following will be some of the fund's key responsibilities:

- Imparting to stakeholders knowledge about renewable energy development and promoting renewable energy development.
- Providing or facilitating the provision of suitable financing for renewable energy businesses.
- Taking cognizance of the previous failure with a BOO structure for wind power, establishing transparent procurement and financing mechanisms, including the provision of subsidies where necessary.

Development of a promotional wind power project, subsequent to establishing the required policy and regulatory framework as outlined above.

B. PROJECT DESCRIPTION

1. Lending instrument

Free-standing GEF project.

2. Project development objective and key indicators

The main objective of the project is to increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emissions from hydrocarbon-based power generation sources.

The key performance indicators are: market penetration of on-grid renewable energy (at least 2% of total supply by the end of the project); GHG emissions avoided from electricity generation (increase from 32,500 to at least 122,500 tons of CO₂ equivalent per year).

Other indicators (see C3 and Annex 3) include: (i) market penetration through increased energy production from wind (% of total electricity production) and corresponding reduction in carbon emissions, (ii) reduction in the cost of electricity generated from wind, (iii) increased number of wind power projects, and (iv) policy development, including establishment of a sustainable financing mechanism for renewable energy.

3. Project global environment objective and key indicators

The global environment objective is to reduce the GHG emissions by removing the barriers to the establishment of a sustainable wind energy market as well as integrate wind energy generation into the energy mix through the operation of a commercial wind farm in Jordan.

4. Project components

The project will consist of the following four main components:

Component 1: Development of a Promotional Wind IPP Power Plant (US\$131.0 million, GEF: US\$1.0 million): This will involve the following sub-components:

- (a) Supply and installation of equipment for generating electricity from wind resources to produce 60-70 MW of electricity in the area of Fujeij (US\$130 million). The scheme, excluding connection to the grid, will be developed and financed by private sector developer on a Build-Own-Operate basis. Studies show that a total of about 200 GWh could be produced annually from a 60-70 MW wind farm. This would form part of the total wind power capacity of 600 MW the GoJ plans to have operational by 2015.
- (b) A portion of the GEF grant (US\$1.0 million) will contribute towards the provision of technical assistance in the design of the wind power plant as well as in the preparation of requests for proposals for the selection of private investors to develop said wind power plant.

Financing for a portion of the incremental cost of the wind farm would be channeled through a renewable energy fund to which the GoJ would contribute (see Component 2). The GoJ has agreed to the financing arrangement.

Component 2: Jordan Renewable Energy and Energy Efficiency Fund (US\$6.9 million, GEF: US\$3.4 million): This will consist of the following two sub-components:

- (a) Establishing a financing mechanism for JORDAN REEF to support renewable energy activities.
- (b) Provision of financial support to JORDAN REEF (US\$3 million) which will be applied to performance-based subsidies for wind power projects. The GoJ will also contribute to the JORDAN REEF (refer to Annex 4).

Component 3: Renewable Energy Technical Assistance Support (US\$2.4 million, GEF: US\$1.4 million) (see Annex 4 for details).

Provision of technical assistance to MEMR, NEPCO, ERC and other stakeholders in the development of renewable energy regarding: (a) strengthening the legal, regulatory, institutional and policy frameworks for the development of renewable energy resources; (b) establishing guidelines for integrating the renewable energy sector into the national energy grid; (c) strengthening project implementation, evaluation and monitoring; (d) developing business models for wind-power plants, including the establishment of portfolios of wind-power plants; (e) raising public awareness for renewable energy development; and (f) strengthening the knowledge base pertaining to renewable energy development through studies, training, workshops, publications and seminars.

Component 4: Development of a Market for Renewable Energy (US\$1.6 million, GEF: US\$0.2 million).

This will involve developing a market for sustained renewable energy through, inter alia: (a) feasibility studies; (b) engineering designs; and (c) other activities related to market development, such as project financing, the evaluation of bids relating to the setting up of wind-power plants, the processing of applications for environmental and other permits, and the processing of applications for regulatory approvals and land titling.

The project components are summarized in the table below.

<i>Component</i>	<i>Indicative Costs (US\$M)</i>	<i>% of Total</i>	<i>Bank financing (US\$M)</i>	<i>% of Bank financing</i>	<i>GEF financing (US\$M)</i>	<i>% of GEF financing*</i>
1. Wind IPP (private sector-financed)	131.0	92.3	0.0	0.0	1.0	16.7
2. JORDAN REEF support	6.90	4.9	0.0	0.0	3.40	56.7
3. Technical assistance	2.40	1.7	0.0	0.0	1.40	23.3
4. Development of a market for renewable energy	1.60	1.1	0.0	0.0	0.20	3.3
Total Project Costs	141.90	100.0	0.00	0.0	6.0	100.00

(1) See Annexes 4 and 5 for details.

* Allocation of GEF grant to each project component (as a percentage of the \$6 million GEF grant).

5. Lessons learned and reflected in the project design

The need to carry out sufficient analyses to determine the cost and corresponding tariff implications of the project prior to bidding: Previous initiatives to involve the private sector in wind power development failed because of inadequate preparation by the government to decide how the incremental costs would be financed. This operation acknowledges the need for a subsidy/grant on commencement of the renewable energy program and aims to establish a suitable financing mechanism that is performance-based, and to ensure sustainability to eventually be able to absorb the full incremental cost through the electricity tariff.

Another lesson is the need to have the policy and regulatory framework ahead of the investment. In this respect, the Renewable Energy Promotion Law will have been promulgated and the financing mechanism for the subsidy/grant will be in place by the time the bidding for the wind farm commences.

6. Alternatives considered and reasons for rejection

First, since GoJ policy is to develop all generation facilities through BOO, the option of a public sector project was rejected. Second, instead of requesting subsidies to be directed to the particular wind power project, to help develop a sustainable renewable energy market it was decided to channel all subsidies through a renewable energy fund and to establish principles for providing the subsidies to projects that require them.

C. IMPLEMENTATION

1. Partnership arrangements

The Government of Japan provided funding through a PHRD grant to study various aspects of renewable energy development. The study included barriers removal through to resource assessment and regulation, resulting in preparation of a renewable energy development and utilization strategy and a renewable energy law. The Bank has also partnered with AfD and

French GEF to provide support for a related project for Energy Sustainability and Environmental Performance.

The GoJ will approach other bilateral financiers once the JORDAN REEF is in place. For the current phase of promotional wind power development, the source of funding is the government (additional subsidy/grant), the private sector (debt and equity), NEPCO (transmission line and substations) and electricity consumers.

2. Institutional and implementation arrangements

The GoJ has established a project coordination unit (PCU) under the Department of Renewable Energy in the Ministry of Energy and Mineral Resources (MEMR). The PCU will be responsible for coordinating the project on behalf of the client. The PCU consists of three key personnel: Project Coordinator, Procurement Officer, and a Financial Officer (see Annex 6 for details). The latter will be based in the Ministry of Planning and International Cooperation (MOPIC). In addition, other personnel, especially in MEMR's directorate responsible for renewable energy, in MOPIC and in NEPCO, will assist the three members in various aspects of project coordination. The PCU will coordinate with other institutions involved in the project, such as the JORDAN REEF (see below), land owners, potential investors and ERC, among others, in preparation and procurement of the wind farm component and in implementation of the other two components prior to establishment of the JORDAN REEF. When established, the JORDAN REEF will be responsible for the technical assistance and project development activities, and for providing performance-based subsidies to projects which require them. The PCU will be responsible for launching the RFP for the wind power BOO component on behalf of MEMR, and will administer the bidding and evaluation process. It will coordinate the technical assistance component and will be responsible for all fiduciary aspects. Annex 6 shows the roles and responsibility of each stakeholder. A suitable mechanism for channeling the performance-based renewable energy subsidy/grant will be in place under the JORDAN REEF prior to disbursement of the subsidy/grant funds.

3. Monitoring and evaluation of outcomes/results

The Results and Monitoring Framework (included in Annex 3) outlines the process for measuring project progress and identifies the required data, information sources and methods of measurement. An independent party will be appointed to certify the results at mid-term and at project completion. M&E will be financed under the technical assistance component, which provides US\$100,000. The focus of the M&E plan is on: (i) market penetration through increased energy production from wind (% of total electricity production) and corresponding reduction in carbon emissions, (ii) reduction in the cost of electricity generated from wind, (iii) increased number of wind power projects, and (iv) policy development, including establishment of a sustainable financing mechanism for renewable energy.

At the global level, the project will evaluate carbon emissions avoided through the replacement of natural gas-based power generation with wind power. These will comprise: (a) emissions directly from the project component during the supervision period; (b) from the project components after the project closes; and (c) indirectly from the project due to project activities such as market development, financing mechanism and regulatory framework. The results of

assessment of the avoided emissions for each category, as well as the assumptions, are shown in the following table.

<u>Results</u>	t CO2e
Direct emissions reductions	1,800,000.00
Direct post project emissions reductions	4,023,529.41
Indirect bottom-up emissions reductions	11,647,058.82
Indirect top-down emissions reductions	14,400,000.00
<u>Key Data</u>	
Annual electricity saved / generated (MWh)	200,000.00
Emissions factor (T CO2 e / MWh)	0.45
Useful Investment Lifetime (years)	20.00
Revolving Fund Size (\$)	5,100,000.00
Revolving Fund turnover factor (t)	2.24
Replication Factor	2.00
P10 (t CO2)	18,000,000.00
GEF Causality Factor (%)	80.00

The calculation is based on the energy generated from wind, which is estimated to save 0.45 ton equivalent of CO₂ per MWh when replacing combined cycle gas turbine plant using natural gas. The source of information will be the off-taker (NEPCO) and the project developer(s).

At the national level, the benefit is the additional energy supply from wind (200 GWh from the promotional investment). To gauge sustainability and replicability, the project will monitor, respectively, the trend in prices offered by the bidders, and the interest of developers in wind power through comparison of the future number of bids and expressions of interest with the recently failed bid.

At the project level, the key performance indicators are: (i) incremental changes to the policy and regulatory framework, (ii) integration of wind power in power system operation, (iii) dissemination to stakeholders of information that will help develop a sustainable renewable energy market and (iv) effective implementation of a 60-70 MW wind power IPP. The progress will be monitored and evaluated through quarterly progress reports.

4. Sustainability

The main issues concerning sustainability is the low bulk tariff for the current natural gas-based generation compared to the estimated tariff that the wind power developer would require. To address this, the government has agreed to bridge the gap that will remain between the offered tariff and average bulk tariff to the off-taker after any nominal subsidy/grant is applied through normal tariff adjustment while it considers formalizing feed-in tariffs for renewable energy. The impact of the promotional project on the bulk tariff will not be significant.

Second, due to Jordan's lack of expertise in wind power development and operation and the GoJ's decision to develop all future power generation facilities through the BOO model, GoJ has decided to involve the private sector in implementing the promotional wind power project.

However, the private sector needs assurance that the legal and regulatory systems are in place to safeguard its investment and ensure an adequate return on it. It may also require specific guarantees to mitigate such risk. To address this, the Renewable Energy Law will have been promulgated.

A third issue is the limited knowledge and therefore possible difficulty by the Single Buyer, NEPCO, to integrate wind power in its generation mix at a premium tariff. To address the latter, one of the key technical assistance components will provide NEPCO the tools and training to include wind energy and power in its generation planning. This will enable it to attach an appropriate value to this resource, which could be higher than currently envisaged due to the intermittent nature of wind. Elimination of the other knowledge, regulatory and financial barriers as well as the rising cost of fossil fuels, will help reduce the gap between wind energy and the current source of supply and thus help sustain wind energy development.

The fourth issue is the sustainability of the JORDAN REEF. Here the GOJ has taken the lead in committing to provide initial capital for the fund (US\$7 million for the first three years) in addition to donor sources, including the proposed GEF grant. The GOJ had contemplated channeling energy consumption tax to the fund, through a provision in the Renewable Energy Promotion Law. Therefore, a combination of initial capital and future sustainable funding sources should help address the sustainability issue of the JORDAN REEF.

5. Replicability

The successful implementation of the promotional investments is important to ensuring they will be replicated. Therefore, an environment conducive to successful implementation needs to be created at the outset. The project is designed to create such an environment through, for instance, properly targeted incentive support and a suitable legal framework. Further enhancement of the environment will be done during implementation of the promotional IPP to ensure subsequent scale-up.

One specific requirement is to alleviate the fear the off-taker may have in including wind power in its generation mix. This will be addressed through one of the technical assistance activities as described above. Another is the need for a suitable performance-based mechanism for channeling subsidies to be in place during the initial period of market development. This will be addressed prior to the promotional investment (See Section B4).

The technical support provided under this project, experience gained during implementation, and the increasing cost of fossil fuels (see Annex 15) should make the environment more attractive both for suppliers and off-takers.

Critical risks and possible controversial aspects (M: modest; S: substantial; H; high)

Risk	Risk Rating (Pre-Mitigation)	Risk Mitigation Measure	Risk Rating (Post Mitigation)
From Outputs to Objective			
Lack of political commitment	S	<p>Over the recent past the highest level in Government has shown high commitment to development of renewable energy resources and ensured that this is reflected in the updated Energy Strategy. As a result, attitudes are also changing at lower levels. Furthermore, a renewable energy law is due for approval in the middle of 2008.</p> <p>In moving forward with this project, the team will ensure that the provisions of the new law are properly reflected in the bidding packages and subsequent agreements.</p>	M
No follow-up wind power investments	M	A combination of the new law and technical assistance provided by the project will help attract both local and foreign developers to the renewable energy business, including wind energy.	M
From Components to Outputs			
Non-competitive bids	S	.Procurement will be through ICB and the RfP package(s) will be reviewed by the Bank prior to bidding.	M
The cost of equipment is high due to escalating energy and equipment costs, resulting in high levelized tariffs, and the delivery period is long.	S	The government is being made aware that equipment costs in general have increased due to high demand and high energy costs. The increase is therefore also applicable to the natural gas-based counterfactual design. Further, the government has	M

Risk	Risk Rating (Pre-Mitigation)	Risk Mitigation Measure	Risk Rating (Post Mitigation)
		<p>already agreed to cover the incremental cost through the bulk tariff, whose impact on the final consumer tariff is estimated not to be significant.</p> <p>The implementation period takes into account the expected long delivery period.</p>	
NEPCO not willing to purchase from IPP because of higher tariff.	M	<p>Accelerated development of renewable energy resources is government policy and forms part of the updated Energy Strategy. NEPCO is expected to contribute to such development. It would, however, like to ensure that least cost renewable options are developed first in order to reduce the level of subsidy it contributes. NEPCO is aware that wind energy is the lowest cost option of the renewable energy candidates.</p>	M
Local financial market not interested in lending for wind power.	S	<p>This will not affect this promotional project which, it is expected, will receive foreign financing. In coordination with AfD and other financiers, this project aims to provide technical assistance to the local financing sector on ways of mitigating the risk of long-term financing for infrastructure projects.</p>	M
Overall Risk Rating	S		M

6. Grant conditions and covenants

Conditions of Negotiation:
None.

Conditions of Board presentation:

None.

Conditions of Effectiveness:

Approval of a project operation manual acceptable to the Bank.

Conditions of disbursement:

The GEF subsidy/grant amount (US\$3 million) is disbursed after the Renewable Energy Promotion Law is enacted; the JORDAN REEF has been established, with a financing mechanism and financial management system acceptable to the Bank.

Covenants:

(1) The GoJ shall ensure that NEPCO is adequately compensated for its cost of acquiring wind power.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

Incremental Cost Analysis

The analysis, based on comparisons between the comparable natural gas-based CCGT baseline power plant and a 65 MW wind farm, is presented in Annex 15. The results show an incremental cost of US\$6.3 million or a levelized incremental cost of 0.50 US cents per kWh. The increment would be partly financed through a performance-based subsidy/grant out of the JORDAN REEF, which would be in place prior to the promotional investment. The remaining incremental cost would be passed through via the bulk supply tariff increase. For the 65 MW promotional wind farm, the analysis assumes that the subsidy/grant out of JORDAN REEF amounts to US\$2.8 million and the remaining would come directly from the tariff. For the baseline power plant, the analysis is based on a natural gas cost of US\$4.0/MMBTU in accordance with the National Energy Strategy (updated December 2007). The economic capital cost used for the wind power facility, at US\$1,813/kW, takes into account the tight supply situation noted earlier.

Economic Analysis – 65 MW Fujeij Wind Farm

The economic analysis assesses the benefits and costs to Jordan from developing a 65 MW wind farm capable of supplying about 200 GWh of electricity annually to Jordan's interconnected system.

Economic benefits are derived from the economic value of electricity generated, where the electricity tariff is assumed to be US\$0.07/kWh – the projected interconnected system power plant tariff to NEPCO in 2011 (commercial operation of the wind farm). The GEF grant of US\$2.8 million is assumed to be earmarked for the wind farm (as a performance-based subsidy/grant) and included as an economic benefit as it reflects global willingness to pay for the wind farm². Economic costs include the US\$118 million estimated installed economic cost of the wind farm, excluding taxes, import duties or price contingencies, and operating costs. Based on these economic costs and benefits, the EIRR of the project is estimated at 5% in the base case.

Financial Analysis -- 65 MW Fujeij Wind Farm

A cash flow model was developed to determine the viability of a 65 MW wind farm in Jordan. The key assumptions used in this cash flow model and the full analysis are summarized in Annex 9.

Project income is derived from the electricity payments over the project's lifetime (20 years), and a one time subsidy/grant payment at the start of construction. Financial outflows relate to operating expenses, interest and repayment of loans. The project's capital costs are financed using a standard limited recourse financing arrangement common for this type of projects in Jordan with 30% equity and 70% debt. For the debt portion of the financing plan, an interest rate of 7.5% is assumed. The debt service coverage ratio is maintained to exceed 1.1 during the loan term.

² In accordance with OP10.04 – Economic Evaluation of Investment Operations, paragraph 8.

To evaluate the financial feasibility of the project, both the net present value (NPV) and the internal rate of return (IRR) to the equity investors have been calculated. The NPV and the rate of return to equity investors are respectively US\$27 million and 15%. The corresponding levelized financial tariff at commercial operation is estimated to be about 12 US cents per kWh.

Financial Analysis of the Electricity Sector

The electricity sector continues to remain financially viable and operates without explicit cash subsidies from the Government budget. The sector comprises primarily of 2 generating companies CEGCO (2006 assets JD513m, sales JD257m, net loss JD1.9m, installed capacity 1,747 MW) and Samra (assets JD112m, net loss JD1m, installed capacity 300 MW), 1 single-buyer transmission company NEPCO (assets JD517m, sales JD506m, net income JD95,633), and 3 regional distribution companies JEPSCO (assets JD316m, sales JD273m, net income JD16m for greater Amman area), EDCO (assets JD174 m, sales JD73m, net loss JD1.4m for southern Jordan) and IDECO (assets JD83 million, sales JD58m, net income JD0.9m for northern Jordan). The average bulk supply tariff to distribution companies and wholesale consumers was JD0.035/kWh in 2006 (US\$0.050), a slight increase from JD0.034 in 2005 (US\$0.049). The average power plant tariff to NEPCO was JD0.032/kWh in 2006 (US\$0.045), up from JD0.031 in 2005 (US\$0.044).

NEPCO will be the off-taker of the promotional wind power IPP. It has been operating as a single-buyer on a cost recovery basis with small profitability. NEPCO possess the financial capacity to absorb the 200 GWh incremental capacity from the project.

Financial Outlook of the Electricity Sector

A financial projection of the sector indicates a rising cost of electricity to NEPCO and consequently to the end-users following the privatization of CEGCO. The average purchased electricity tariff by NEPCO is projected to increase from JD0.032/kWh (US\$0.045) in 2006 to an average of JD0.054/kWh (US\$0.077) in 2008 when the post-privatized CEGCO tariffs become effective. Higher post-privatization capacity charges of CEGCO's power plants and the higher fuel cost contribute significantly to this increase. In light of the increase, the bulk supply tariffs are expected to be adjusted during 2007 to smooth out the impact of the increase. The impact of the average tariff increase is projected to slightly decline, to about JD0.049/kWh (US\$0.07), in the following five years due to more electricity being supplied by lower-tariff power plants such as Samra and the new IPPs.

At the distribution tariffs level it will be necessary to incorporate the details of EDCO and IDECO privatization, which is not available at this time. It is likely, however, that the distribution tariffs will have to be increased due to the double impacts of the rise in the average generation tariff and of the privatization of the distribution companies. It will be crucial to monitor end-users tariff adjustment in the coming years as this will impact the financial performance of the electricity companies.

Technical

GoJ engaged Lahmeyer International (LI) to carry out wind measurements to supplement those already available and assess the potential for wind power in various regions of the country. The results show that sites with Full Load Hours (FLH) ranging from 3,000 to 3,500 have a potential of about 4,200 MW and annual generation of about 13,000 GWh. Sites with FLH above 3500 have a potential of about 250 MW. The analysis carried out by LI was for a 60 MW wind farm based on conditions prevailing at Fujeij: a capacity factor of 39% (equivalent to 3434 FLH) and harvestable average power of about 2W/m² using Class II Wind Energy Converter (WEC): 58 m rotor diameter, 850 kW nominal capacity, 55m hub height, and applying the Gamesa G58 power curve. Taking into account the risk of lower wind speeds, the current analysis uses a lower capacity factor of 35% and installed capacity of 65MW to achieve the same energy output per year. The exact site(s), turbine sizing and layout will be decided by the winning bidder. With continued turbine design to reduce cost, it is likely that larger sizes offering a lower cost per kW could be used.

2. Fiduciary

Procurement: The largest procurement is of a private developer for wind farm(s) and WEC(s) totaling 60-70 MW. The IPP will be procured under international competitive bidding procedures reviewed by and found acceptable to the Bank. GEF will contribute to the JORDAN REEF, which will provide a short-term performance-based subsidy/grant to the IPP and other renewable projects.

Consulting services to be contracted under the project include services for the promotional project, studies, public awareness, and training. The project will also finance the development of future wind projects, such as: consultancy services for feasibility studies, detailed engineering designs, preparation, launch and evaluation of bids, miscellaneous project financing costs, environmental and other permit costs, regulatory approval, land titling, and other development costs. Consultants will be selected following the Bank's Guidelines. For the development costs, provided the developer has been selected competitively, selection may use commercial practices.

The overall risk was assessed to be Average. MEMR and the key staff of the PCU have experience in implementing IPPs schemes, managing technical assistance and are familiar with the Bank procedures for the selection of Consultants. However, the procurement capacity of the PCU needs to be strengthened further through additional training on the Bank's guidelines (procurement and Consultants). The training would be delivered before effectiveness and would target the procurement officer as well as selected members of the Special Tender Committee. The full assessment is contained in the project files

3. Social

Socioeconomic issues arising from the project are expected to be minimal. It is likely to have a minor positive impact through the spending of money by contractors in local shops and villages. The workforce during the construction phase will likely not exceed forty whilst during operation there may be two staff required on site to run and maintain the project. A security guard may also be employed to protect the project from vandalism during the operational phase.

The project will not involve the displacement of local people, but the transmission line may involve acquisition of small sections of land for the tower bases and damage of crops during construction, for which compensation will be made by NEPCO. For this, a RPF was prepared and was disclosed on November 13, 2007.

4. Environment

ENVIRONMENTAL IMPACTS

The project falls under environmental category B per the Bank's policy on Environmental Assessment (OP4.01). The government was required to carry out an environmental assessment prior to project appraisal. The report was disclosed on November 13, 2007. A full EIA shall be conducted by the selected developer.

The assessment established no environmental impacts that represent a significant impediment to the project. Where impacts were identified these have been quantified and where possible mitigation strategies have been recommended to counteract them.

Air quality

The principle impacts associated with air quality relate to the generation of dust during the construction phase of the project and the emission of fumes by on site vehicles and generators, etc. These can be counteracted through the employment of dust suppression techniques and though best practice such as making sure engines are not running unnecessarily. During the operational phase the project should represent a significant benefit to national air quality through the displacement of fossil fuel generation plant.

Water quality and geology

As with air quality the principle impacts to water quality would be those during the construction rather than the operational phase. The developer should seek to minimize the potential for soil and water contamination by ensuring that all oil storage tanks, etc. are properly banded and that wastes are disposed of in an appropriate manner by a licensed contractor.

Noise

Given the separation to nearby residences it is not considered that noise will represent a significant environmental issue for the project. The impacts of noise emanating from the turbines can be reduced by maximizing the distance between the nearest residence and the closest turbine.

Landscape

It is not considered that the project will give rise to any significant landscape or visual impacts. The project site is not of any great landscape significance with the immediate area being of a rural nature but housing many man made features. The impact of the turbines can perhaps be reduced a little through the planting of trees and vegetation to improve the appearance of the site though the planting of fast growing trees that could generate turbulence for the proposed turbines should be avoided.

Transport and infrastructure

There are no significant issues with regard to transportation of the turbines to the proposed site, or of other traffic movements associated with the project. The developer should ensure as part of the EMMP that all drivers entering and leaving the site should obey the Jordanian laws with regard to speed etc. If necessary consideration should be given to the establishment of wheel-washing facilities to decrease the amounts of dust and mud being taken on to the highway network by vehicles leaving the site in the construction phase.

Ecology

It is considered that there will be no significant ecological impacts associated with the construction and operation of the proposed wind farm, though it is recommended that additional survey work be undertaken to assess the potential impact during the bird migratory seasons of autumn and spring.

Cultural heritage

The site has been identified as being of some archaeological interest, though it is considered that through proper placement of the proposed turbines that the impact can be sufficiently mitigated to prove acceptable. The developer should avoid placement of turbines on, or in the immediate vicinity of the identified archaeological sites and should report the finding of any archaeological artifacts to the department of antiquities as and when these are encountered during the construction phase so as to allow for their proper consideration and if necessary protection.

5. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property (OPN 11.03 , being revised as OP 4.11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indigenous Peoples (OD 4.20 , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas (OP/BP/GP 7.60)*	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways (OP/BP/GP 7.50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

6. Policy Exceptions and Readiness

- No policy exceptions are anticipated for the proposed project.
- Design of the JORDAN REEF is complete.
- Selection of a consultant to assist with selection of the promotion wind farm developer is close to completion.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas

Annex 1: Country and Sector Background

JORDAN: PROMOTION OF A WIND POWER MARKET

A country of 5.6 million people in the Middle East, Jordan has a steadily growing economy, but with a fiscal deficit of 7% (2006, excluding grants³), and a stock of declining gross external public debt of around 51% of GDP. Jordan is almost entirely dependent on oil imports to meet its energy requirements (94% dependence). Oil and gas imports are estimated at US\$2.4 billion or 17% of GDP in 2006, a significant increase from about 8% of GDP in 2003⁴.

The electricity sector in Jordan is governed by the General Electricity Law, which empowers the Ministry of Energy and Mineral Resources (MEMR) to establish policies and general rules for the power sector. This Law creates an independent regulatory commission to protect the interest of consumers and investors, approve tariffs and grant licenses for generation and distribution of electricity, including tariffs for independent power producers.

Jordan has about 2,100 MW of installed power generation capacity, of which just 17 MW is contributed by renewable energy, with the rest coming from oil, gas and diesel. Currently, over 1,700 MW of power capacity comes from four power plants, Aqaba, Rehab, Hussein and Samra. The electricity demand is expected to exceed 21,000 GWh by 2015 from 11,000 GWh in 2006.

As part of a decade-long structural reform of its economy, Jordan has sought to diversify its fuel mix and supply sources in order to reduce dependence on imports and the use of oil, as well as the consequent adverse balance of payments situation. Achieving energy security to meet the needs in an economical and environmentally sustainable way is another key challenge.

Increasing the share of natural gas significantly, promoting renewable energy sources (wind, solar, biogas and geothermal), and promoting energy use efficiency are the three principal means through which the GoJ seeks to achieve a more sustainable energy balance in the future.

In addition to the fuel mix issue, the GoJ has also made significant efforts in institutional reform in the power sector by moving towards privatization and promoting public-private partnerships in generation, transmission and distribution areas. Under the General Electric Law, the Jordan Electricity Authority was converted into a public shareholding company, National Electric Power Company (NEPCO), which is responsible for most of the electricity generation. In 1999, NEPCO was divided into three companies for generation, transmission and distribution. Now there are three distribution companies, all of which are partly government-owned and are at various stages of privatization. The country largest generator, Central Electricity Generating Company (CEGCO), was privatized in October 2007 with 51% private ownership. The first IPP project, the 370 MW combined cycle Amman East Power Plant, successfully raised US\$300 million of

³ 3.8% including grants.

⁴ Source: IMF -- Oil-gas imports, f.o.b. US\$797 (2003); US\$1,372 (2004); US\$2,151 (2005); US\$2,421 (2006 preliminary)

private capital in 2007. Work is already underway for the development of a second combined cycle IPP at Al-Qatrana, ninety kilometers south of Amman.

In the petroleum sector, the GoJ is finalizing a plan to expand the refining capacity of its sole refinery, the Jordan Petroleum Refinery Company (“JPRC”). It is envisaged that a strategic partner will be invited to implement the project. In addition to the main oil-purchase contracts with the ARAMCO Company of Saudi Arabia, the GoJ concluded an agreement with the Government of Iraq in August 2006 to supply 10-30% of Jordan’s daily crude oil requirement (estimated at around 100 thousand barrels per day). Furthermore, the GoJ is planning to build a crude oil pipeline from Aqaba to JPRC at Zarqa near Amman to supplement the current over-land transportation of crude oil.

Past Renewable Energy Experience

Following WSSD, the GoJ committed to achieving a 7% share of the total energy through renewables by 2015. In pursuance of this goal, the government has initiated a number of activities with partner assistance.

Jordan has been working in a number of renewable energy areas since early 1970s through collaboration with international organizations like GTZ, UNDP, RISO, DEWI, etc. in research, training, measurements, feasibility studies and pilot projects. Significant experience has been gathered in solar heating (15% of households use solar water heaters) and cooling applications, water pumping, photovoltaics for communications, etc.

Jordan has a strong wind regime, especially on the western side of the country, where annual average wind speed exceeds 7 meters per second (m/s). A wind atlas has existed for Jordan since 1988, and was updated in 1999 by MEMR. Based on the initial data, two German-assisted pilot wind farms – 4x80 kW at Al-Ibrhymia and 5x225kW at Hofa – have been in operation since 1996.

In addition, with support from the Japanese Trust Fund, a detailed resource assessment and barrier removal study, which established the total potential for wind power in the country, was concluded. It shows that the potential exceeds 4,000 MW.

Through all these activities, the government has demonstrated strong commitment to promoting renewable energy sources as strategic energy options for the country.

Barriers in the Renewable Energy Sector

The renewable energy program in Jordan has essentially remained at a pilot level (with the exception of domestic solar water heating) since its initiation in the early 1970s. In order to take the program to the next level of commercial exploitation, it is necessary to address the barriers that hinder the progress of the RE technologies. While the power sector reform undertaken until now has cleared the way for private sector involvement in Jordan, there are still strong barriers in

the RE sector in the form of capacity constraints and lack of experience in public-private partnerships. On the project development side, there is a need to develop efficient business models involving IPPs, create access to commercial financing, and later generate demand for commercial financing. Key barriers to be addressed in the proposed project are discussed below:

Project financing. Given the high upfront costs required for RE projects, having access to low cost financing is critical. The financial/banking sector in Jordan is robust but is limited in attracting large scale investments⁵, and requires deepening to be able to feed the economic growth. There are 23 deposit-taking banks in Jordan: 13 commercial banks, 2 Islamic banks and 8 foreign banks⁶. In 2006, total deposits at licensed banks reached JD14.6 billion (US\$20.8 billion), comprising 60% of time deposits. Foreign currencies make up about one-third of the total deposits. On the lending side, total credit outstanding reached JD9.8 billion (US\$14.0 billion), over 93% of which were made to individuals and the private sector. About 10.2% of the total credits were denominated in foreign currencies. The prime lending rate was 7.5% while the weighted average loan interest rate was 8.56%⁷. However, due to the lack of large scale renewable energy projects in Jordan, it is unlikely that commercial banks would be prepared to provide the long-term financing required or even to lend to them. Lack of awareness among the banking community, the relatively small size of a renewable energy project, the resultant perception of high risk, and some shortfalls in the legal/regulatory framework to enable a streamlined financing for RE, may make them averse to such transactions. Providing technical assistance to overcome the information constraints, helping evolve a legal/regulatory framework, developing protocols for project due-diligence and mobilizing co-funding from international sources are some of the measures that need to be taken up to address this barrier.

Technical and management capacity. There is a lack of awareness among prospective entrepreneurs/industries regarding RE technologies, and lack of capacity for analyzing RE projects including technical due diligence and financial cost-benefit analysis. Furthermore, entrepreneurs/industries have little access to experience from elsewhere. It is important, therefore, to develop and implement a communication strategy that would reach all the relevant stakeholders, provide training on various techno-economic aspects (e.g. grid connectivity issues, reactive power, etc.) that would enable them to make informed choices of investment in renewable energy, and foster public-private partnerships that would facilitate the projects.

High implementation costs. Most RE projects tend to have high costs associated with them in the initial stages of sector development, which could reduce as the volume increases. For instance, the levelized economic energy cost from the proposed wind power project is around 9-11 US cents as compared to the present average generation tariff of about 4.5 US cents (2006). In order to demonstrate the efficacy of these technologies, to help bring down the costs and to attract prospective developers, and to demonstrate the government's commitment to developing the country's renewable energy potential through the private sector, it is necessary to support the

⁵ For the first combined-cycle Amman East IPP, a Jordanian bank participated in the syndication of the commercial loan facility by subscribing to US\$15 million out of the total US\$45 million facility.

⁶ Source: Central Bank of Jordan.

⁷ Source: Central Bank of Jordan.

initial project through low-cost loans or grants to meet the incremental cost while putting in place the necessary framework to ensure sustainability and growth.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies
JORDAN: PROMOTION OF A WIND POWER MARKET

Prior to the financial close of the Amman East Power Plant Project in March 2007, the Bank mostly engaged in analytical works in the energy sector in Jordan. The Amman East Power Plant Project is being supported by a US\$45 million IBRD PRG, covering the commercial loan creditors of the project. Other donors/lenders such as the European Union, USAID and various Arab financial institutions support the development of the power sector in Jordan. The most recent activities sponsored by the Bank are shown below:

Agency	Activity	Target Issue (s)
PPIAF	Tariff setting for the Electricity Regulatory Commission	Support the newly created regulatory agency in tariff setting
PHRD Climate Change	Enabling activities	Promote the growth of renewable energy in Jordan
Danish Trust Fund	Energy Strategy	Identify critical issues and options in the Jordan's energy sector
PPIAF	Design of a transition strategy for the national Electricity Company (NEPCO)	Prepare NEPCO to effect the transition from single buyer to wholesale and ultimately to competition as the market evolve.
USAID	Privatization of the power sector	Facilitate the privatization of electricity companies through assistance in the design and implementation of transactions.
World Bank	US\$45 million IBRD PRG	Provide political risk coverage for commercial creditors of the project as part of the total US\$300 million project cost.
World Bank	Energy strategy update	Technical assistance in updating Jordan's energy strategy, inclusive of demand forecasts and supply options analyses.

Annex 3: Results Framework and Monitoring
JORDAN: PROMOTION OF A WIND POWER MARKET

Results Framework

PDO / Global Environmental Objective	Project Outcome Indicators	Use of Project Outcome Information
Increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emissions from hydrocarbon-based power generation sources.	<ol style="list-style-type: none"> 1. Increased electricity supply from grid-connected renewable power (from 72 to 272 GWh) 2. Increased number of private developers of wind power (from 0 to one or more) 3. Avoided direct CO₂ emissions increased by 90,000 ton per year. 4. Reduced levelized cost offered by bidders of real 6-7 US cents based on 2003 prices. 5. A fund for renewable energy fully operational by the second year. 	Measure success in achieving overall Project Development and Global Environmental objectives
Intermediate Outcomes	Intermediate Outcome Indicators	Use of Intermediate Outcome Monitoring
Risk and cost barriers for independent wind power development removed.	<ol style="list-style-type: none"> 1. Incremental changes to policy and regulatory framework (IPP approval process; tariff approval) implemented. 2. A financing mechanism, including performance-based incentives and tariff to help mitigate incremental costs in place. 	Assess extent to which policy and regulatory barriers and lack of financial incentives have been removed
Sufficient information and knowledge on wind power development.	<ol style="list-style-type: none"> 1. Information prepared and disseminated to stakeholders. 2. Wind power properly integrated in power system operation. 	Assess extent to which the knowledge barrier has been removed
Begin to develop a commercial IPP wind power industry.	60-70 MW of wind power IPPs operational.	Gauge market interest in wind power development
Provide support to project developers	Prospective developers supported	Gauge success of support scheme

Arrangements for results monitoring

Outcome Indicators	Baseline	Target Values				Data Collection and Reporting		
		YR1	YR2	YR3	YR4-9	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emissions from hydrocarbon-based power generation sources .	Current GWh from Renewable Energy: 72	72	72	72	272 (2% of total electricity supply)	Quarterly and mid-term	IPP and NEPCO measurements	MEMR, NEPCO
	No. of IPPs in wind power: 0	0	0	1	1 or more	Annually	Expressions of Interest, Bids	MEMR
	Current direct ton of CO ₂ equivalent avoided: 32,500	32,500	32,500	32,500	122,500	Annually	Calculations based on energy supplied to NEPCO.	MEMR, JORDAN REEF
	Levelized economic cost 7-8+ cents/ kWh in 2001	7-9 cent/ kWh (inflation-adjusted) for promotional IPP	7-9 c/kWh	7-9c/kWh	7-9 c/kWh	Upon receipt of bids for promotional IPP	Bids/ PPA	MEMR
	No renewable energy fund or financing mechanism.	A financing mechanism in place	A fund for renewable energy fully operational	Complete	Complete	Quarterly and mid-term.	Quarterly and annual reports.	MEMR
Results Indicators for Each Component								
Barrier removal activities	Policy and reg. framework for electricity has gaps with respect to renewable energy (e.g. pricing and concession).	Legislative changes complete	Complete	Complete	Complete	Quarterly and mid-term	Progress reports	MEMR
	No formal financing mechanism for wind power.	Mechanism designed and operational	Complete	Complete	Complete	Quarterly and mid-term	Progress reports	MEMR
	Lack of knowledge by	Training and provision of	Planning staff in NEPCO and	Wind power fully	Complete	Quarterly and mid-term	Progress reports	MEMR

		Target Values				Data Collection and Reporting		
	NEPCO and MEMR to incorporate wind energy in generation model.	software and hardware in progress.	MEMR trained.	incorporated				
	Knowledge on wind power lacking (Target: 10 institutions and 100 individuals)..	Awareness campaigns for MEMR, NEPCO, financial sector and prospective local developers designed	25%.	50%.	100%.	Quarterly and mid-term	Progress reports	MEMR
	No indicative wind power development plan	Study complete.	Complete	Complete.	Complete	Quarterly and mid-term	Progress reports	MEMR
Wind IPP	None	At least one promoter identified	Financial close	Satisfactory construction progress	+65 MW operational	Quarterly and mid-term	Progress reports	MEMR
Project Development Support	No facility in place.	Facility designed and in place	No. of applications (5)	No. of applications (10)	No. of applications (20)	Quarterly and mid-term	MEMR/responsible bank reports.	MEMR/responsible bank

Calculation of Avoided Emission Benefits

The project will evaluate carbon emissions avoided through the replacement of natural gas-based power generation with wind power. These will comprise: (a) emissions directly from the project component during the supervision period; (b) from the project components after the project closes; and (c) indirectly from the project due to project activities such as market development, financing mechanism and regulatory framework. The indirect bottom-up calculation is derived by multiplying the sum of (a) and (b) to the assumed replication factor (2). The indirect top-down calculation assumes 600 MW of installed wind power capacity in ten years (as per the National Energy Strategy, including the proposed investment) and GEF causality factor of 80% in calculating the emission benefits

The results of assessment of the avoided emissions for each category, as well as the assumptions, are shown in the following table.

Results	t CO₂e
Direct emissions reductions	1,800,000.00
Direct post project emissions reductions	4,023,529.41
Indirect bottom-up emissions reductions	11,647,058.82
Indirect top-down emissions reductions	14,400,000.00
Key Data	
Annual electricity saved / generated (MWh)	200,000.00
Emissions factor (T CO ₂ e / MWh)	0.45
Useful Investment Lifetime (years)	20.00
Revolving Fund Size (\$)	5,100,000.00
Revolving Fund turnover factor (t)	2.24
Replication Factor	2.00
P10 (t CO ₂)	18,000,000.00
GEF Causality Factor (%)	80.00

The annual electricity saved / generated of 200,000 MWh is based on the Promotional Wind IPP (Component 1 of the project). The emissions factor of 0.45 ton CO₂ equivalent per MWh assumes that wind power replaces power from natural gas-based power plant.

The revolving fund size of US\$5.1 million is derived from the US\$3 million of the proposed GEF grant (Component 2 b of the project) plus the budgeted government counterpart financing of US\$2.1 million (JD1.5 million) in the first year of JORDAN REEF's operation. The revolving fund turnover factor is derived from dividing the projected amount of investment through JORDAN REEF from year 4 to year 10 by the initial revolving fund size (US\$5.1 million).

Annex 4: Detailed Project Description

JORDAN: PROMOTION OF A WIND POWER MARKET

Project Development Objective

The main objective of the project is to increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emissions from hydrocarbon-based power generation sources.

Previous Experience

In 2002 MEMR received two proposals from two international joint ventures for the development and operation of a 75-90 MW Wind Power Project on a Build-Own-Operate (BOO basis) at three pre-selected sites (Fujeij, Wadi Araba, and Hofa) with (25-30) MW per site.

The proposals were submitted by a Spanish company, Energia Hidroelectrica de Navara (EHN) for Fujeij and Wadi Araba sites, and a German Company, WindSolar AG (WSAG) as a lead sponsor of a consortium for the three sites. EHN was ranked first bidder for Wadi Araba and Fujeij sites. EHN proposed building two wind parks, one at Fujeij site and one at Wadi Araba. Both sites are located in the Southern part of the country. Each wind park would have been equipped with 35 V52/ 850 Vestas wind turbines for a total installed capacity of 30MW and estimated annual energy yield of about 70 GWh/ year to be fed into the National Grid. The estimated cost was about US\$30 million for each wind park and the offered tariff was 6.72 US cents/ kWh for Wadi Araba and 7.04 US cents/ kWh for Fujeij.

The WSAG consortium proposal for Wadi Araba consisted of 20 NEG Micon 72C/ 1500 kW wind turbines for an installed capacity of 30 MW and annual energy yield of about 96 GWh/ year. The cost was about US\$37 million and the tariff, 8.772 US c/ kWh.

Each tariff proposal imposed an increment on the prevailing average generation tariff whose burden NEPCO was unwilling to carry. DANIDA was approached to provide grant financing for the project but were unwilling to do so in the absence of a strategy for ensuring sustainability. The current project aims to address this problem by providing initial performance-based financing towards the incremental cost (on a per kWh basis or based on criteria measured upon operational acceptance) and supporting activities necessary for removing the various barriers that contribute to the high tariffs⁸.

Component 1: Development of a Promotional Wind IPP Power Plant (US\$131.0 million, GEF US\$1.0 million)

This component will comprise the following two subcomponents:

- (a) Development of a wind farm and associated infrastructure to produce between 60 and 70 MW of electricity in the area of Fujeij, through a Build-Own-Operate structure. The sizing of the plant
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follows studies showing that capacity factors of 39% are achievable at Fujeij and Wadi Araba (refer to Annex 12). The proposed scheme would produce about 200 GWh per annum. The MEMR, assisted by its consultants, has identified the general locations of the wind farm(s). The project developer will decide the precise locations. The developer will build, own and operate the wind farm and conversion equipment, up to and including the step-up transformers. NEPCO will construct and operate the associated infrastructure, comprising transmission lines and grid substation.

- (b) A portion of the GEF grant will contribute towards the provision of technical assistance in the design of the wind power plant as well as in the preparation of requests for proposals for the selection of private investors to develop said wind power plant.

The performance criteria, such as efficiency, will be set out in the relevant contract.

Component 2: Jordan Renewable Energy and Energy Efficiency Fund (US\$6.9 million, GEF US\$3.4 million):

- a) The project will assist in establishing a financing mechanism for JORDAN REEF to support renewable energy activities. Such mechanism will be performance-based (based on outputs). However, to ensure maximum impact of the subsidy/grant on the levelized tariff offered by the developer, it is desirable to disburse the total subsidy/grant amount early in the project. In this case, the developer would be requested to provide a bank guarantee whose value would be reduced according to the delivered electrical energy and avoided carbon emissions. Details of the subsidy/grant mechanism will be prepared by the JORDAN REEF prior to disbursement of the subsidy/grant amount by GEF.
- b) The project will provide financial support to JORDAN REEF (US\$3 million), to be applied towards wind power projects in accordance with the above-mentioned subsidy/grant mechanism. The GoJ has also committed to provide JD5.0 million (US\$7.0 million) during the first three years of JORDAN REEF operation, part of which will be utilized under this component. Consultancy for JORDAN REEF establishment is nearing completion. The subsidy/grant would be disbursed based on performance. The financing of the incremental cost of the promotional wind farm will be from a subsidy/grant as well as tariff pass-through, as follows:

Source	Incremental Cost of the Promotion Wind IPP US\$ million
JORDAN REEF (supported by GEF and others):	2.8
Tariff Pass-through	3.5
Total	6.3

Summary Description of Jordan Renewable Energy and Energy Efficiency Fund (“JORDAN REEF”)

Overview	The initial design of the JORDAN REEF features five windows offering specific types of financial
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	<p>products or support, overseen by a single administrative organization.</p> <p>The first three windows are expected to commence operations following JORDAN REEF establishment.</p> <p>(i) RE Subsidy window</p> <ul style="list-style-type: none"> – provide a per-kWh subsidy to buy down the cost of RE power generated by privately built, owned and operated facilities. – about US\$3.7 million is earmarked for this window in the first three years of operation, comprising US\$3 million of the proposed GEF grant and government counterpart financing. <p>(ii) RE and EE Guarantee window</p> <ul style="list-style-type: none"> – provide resources for the creation of a dedicated loan guarantee program, to be managed by the existing Jordan Loan Guarantee Corporation. This window will facilitate access to credit by ESCOS and other companies engaged in deployment of RE technologies. – about US\$5 million is earmarked for this window in the first three years of operation, comprising of US\$2 million potentially from a donor and government counterpart financing. <p>(iii) Studies and Technical Cooperation window</p> <ul style="list-style-type: none"> – provide grants for a range of activities that promote RE and EE, including feasibility studies, training program, awareness campaign and research and development. – about US\$8.8 million is earmarked for this window in the first three years of operation, comprising of US\$1.6 million of the proposed GEF grant, US\$1 million GEF medium-size project grant, US\$2.3 million of FFEM grant, US\$1.2 million potentially from a donor, and government counterpart financing. <p>(iv) RE and EE Interest Rate Subsidy window</p> <ul style="list-style-type: none"> – provide interest-rate subsidies to reduce the cost of commercial loans to ESCOs and other specialist companies in RE and EE sector. – about US\$2.8 million is earmarked for this window in the first three years of operation, comprising of US\$2.4 million potentially from a donor and government counterpart financing. <p>(v) Equity window</p> <ul style="list-style-type: none"> – deploy resources to invest in RE and EE ventures. – not active initially
<p>Governance Structure</p>	<p>JORDAN REEF will be established as a mixed public/private institution under a by-law in accordance with the Renewable Energy Promotion Law.</p> <p>Board of Directors</p> <ul style="list-style-type: none"> – Comprise of nine members. – The Chairman of the Board will be the Minister of Energy and Mineral Resources, or his nominee. – Other board members include the Ministers of Environment, Planning and International Cooperation, Finance or their nominees. – The remaining four board members shall represent the private sector in energy-intensive or key economic sectors (banking, industry, energy, commerce, construction, transport, water and irrigation). – The Board of Directors shall delegate powers and authorities to the Executive Director and/or the Operations Committee as may be required. <p>Executive Director, to be appointed by the Board of Directors</p>

	<p>Operations Committee shall comprise the Executive Director and other managers responsible for the various windows and other managerial duties.</p> <p>Technical Advisory Board shall provide advisory support on technical matters pertaining to assessment of proposals and monitoring and evaluation of the impact of JORDAN REEF's activities.</p>
<p>Eligibility Criteria for Various Windows</p>	<p>(i) RE Subsidy window:</p> <ul style="list-style-type: none"> – Eligible recipients will be a project entity participating in a competitive tender issued by the Ministry of Energy and Mineral Resources – Built-own-operate arrangement with private financing and operating license – Meet World Bank and other donors' social and environmental safeguard guidelines <p>(ii) RE and EE Guarantee window:</p> <ul style="list-style-type: none"> – Small and medium enterprises (SMEs) active in the RE and EE sectors in Jordan. <p>(iii) Studies and Technical Cooperation window:</p> <ul style="list-style-type: none"> – Non-profit, public or private sector entities that develop RE/EE activities in Jordan. – <i>Eligible activities</i> may include: preparatory work leading to the implementation of RE/EE project, in particular energy audits and feasibility studies; training and capacity building of personnel; awareness campaigns, demand-side management program, RE/EE publicity and promotional events. <p>(iv) RE and EE Interest Rate Subsidy window:</p> <ul style="list-style-type: none"> – Small and medium enterprises active in the RE/EE sectors in Jordan, such as ES COs, solar water heater installation companies, etc. <p>(v) Equity window:</p> <ul style="list-style-type: none"> – Investments in closed-end funds where it will then invest in projects or businesses engaged in the manufacture, deployment, ownership and operation of RE/EE technologies in Jordan.
<p>Monitoring, Evaluation and Reporting Requirement</p>	<ul style="list-style-type: none"> – The Ministry of Energy and Mineral Resources is vested with the monitoring and evaluation responsibility of JORDAN REEF's activities. – JORDANREEF will be required to meet the <u>fiduciary requirements of the World Bank and of the other donors</u>. – JORDANREEF shall prepare an Annual Report, detailing a complete account of activities carried out and technical, financial and promotional results achieved during the previous year. The Annual Report shall be submitted to the Board of Directors at the end of the first quarter of the subsequent financial year. Once approved, it will be sent to the Council of Ministers for review, and to the Ministry of Energy and Mineral Resources for monitoring and evaluation.
<p>Funding Sources</p>	<p>The JORDANREEF main funding sources shall include:</p> <ul style="list-style-type: none"> (i) Annual government general budget allocation^a (ii) Aids, donations, grants, funds or any financial support from any entity or national, Arab and international institution received by the JORDAN REEF (iii) Proceeds generated from JORDAN REEF's activities <p>It is envisaged that JORDAN REEF may raise fund directly via the capital markets should there be a need for additional funding.</p> <p>Note (a): The Government of Jordan has initially committed JD5 million (US\$ 7 million) counterpart</p>

	financing for the whole project, comprising JD1.5 million (US\$2.1 million) for the year 2008, JD1.5 million for the year 2009 and JD2 million (US\$2.8 million) for the year 2010. Additional government budget allocation will be determined on an on-going basis. Other sustainable funding sources were contemplated during project preparation (e.g. charges on consumption of imported and fossil-based energy), and these will be confirmed following JORDANREEF establishment.
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Component 3: Renewable Energy Technical Assistance Support (US\$2.4 million, GEF: US\$1.4 million)

Provision of technical assistance to MEMR, NEPCO, ERC and other stakeholders in the development of renewable energy regarding: (a) strengthening the legal, regulatory, institutional and policy frameworks for the development of renewable energy resources; (b) establishing guidelines for integrating the renewable energy sector into the national energy grid; (c) strengthening Project implementation, evaluation and monitoring; (d) developing business models for wind-power plants, including the establishment of portfolios of wind-power plants; (e) raising public awareness for renewable energy development; and (f) strengthening the knowledge base pertaining to renewable energy development through studies, training, workshops, publications and seminars. The sub-components are summarized below:

Policy and regulatory framework (US\$0.4 million): It is expected that the Renewable Energy law will be approved prior to project approval. This component would therefore involve subsidiary legislation and more specific procedures, including the following:

- Streamline the currently protracted procedures for the selection and licensing of private developers of infrastructure projects, including power. There is also a need to differentiate between small projects that could be promoted solely by local entrepreneurs and mega project. The current law requires that the first two IPPs, irrespective of size, are approved by the Cabinet. The project would assist in making changes that facilitate economy, efficiency and transparency in the selection of developers.
- Make provisions that create a level playing field between conventional and renewables-based power generation and supply, including the integration of the latter in grid-based supply, and its impact/benefits on cross-border trade.
- Develop a suitable grid code, reserve capacity requirements, technical standards, wheeling charges, etc, to ensure that renewable energy sources do not cause instability problems if incorporated in the grid (see also below).
- Design renewable energy policy instruments (e.g. market policies and financial incentive policies, including grants, loans, tax credits and carbon financing).
- Determine the impact of sector privatization and deregulation of the power sector on renewable energy development.

Dissemination of information (US\$1.4 million): This will consist of several workshops to disseminate the results of each of the studies and solicit the views of key stakeholders prior to adopting the associated recommendations. In addition, the component will support development of data and documentation to guide private parties through the process required for project development.

Integration of renewable energy in the grid (US\$0.5 million): The main part of the component involves raising awareness in NEPCO about the benefits of wind power when integrated in its generation mix. It will also raise awareness of other stakeholders on wind energy. The scope will comprise visits to other utilities that have successfully incorporated wind energy in their grid operations as well as training in the planning and design of wind power schemes. The latter will include the supply of tools that enable the incorporation of wind energy in the power generation planning model. This will allow NEPCO and MEMR to better assess the value of wind energy in integrated power system operation and if necessary reserve an appropriate tariff for wind power.

Monitoring and evaluation (US\$0.1 million): This component will comprise an independent evaluation of the project outcomes and achievement of objectives, at mid-term and upon completion, as described in Section C3.

Component 4: Development of a Market for Renewable Energy (US\$1.6 million, GEF: \$0.2 million)

This component will provide contingent financing designed to promote market development for renewable energy beyond the proposed project. The development costs that can be financed are: feasibility studies, detailed engineering designs, preparation, launch and evaluation of bids, miscellaneous project financing costs, environmental and other permit costs, regulatory approval, land titling, and other development costs. This will also comprise the development of business models for IPPs, who will be the dominant developers of wind energy, and prepare an indicative plan for wind power development following from the ongoing work on wind potential assessment.

Initially, the financing will be cost-shared between the project developer and the JORDAN REEF. As the market develops it will be provided as 100% project development loans. An independent panel will review the request for funding under either window and make recommendations to MEMR or JORDAN REEF upon its establishment.

A tentative allocation of the amount is shown in Annex 5.

Annex 5: Project Costs
JORDAN: PROMOTION OF A WIND POWER MARKET

Project Cost By Component and/or Activity	Local US \$million	Foreign US \$million	Total US \$million
1. Wind Power Plant and Associated Infrastructure	17.1	112.8	129.9
1.1 Wind turbine (2MW x 32)			
- Design, manuf., transp., and install.	9.35	84.12	93.47
- Central monitoring system	0.04	0.34	0.38
- Spare parts and tools	0.13	1.14	1.27
- Training O&M staff	0.01	0.11	0.13
1.2 Civil works			
- Wind turbine foundations	3.54	0.39	3.94
- Access road	0.29	0.03	0.32
- Control room and storage facilities	0.80	0.09	0.89
1.3 Grid connection			
- Substation extension	0.06	0.57	0.64
- Wind farm substation	1.02	9.14	10.16
- MV switchboard and transformers	1.63	14.63	16.26
- 132 kV feeder	0.23	2.06	2.29
- Other costs (insurance, shipment, etc)	0.01	0.11	0.13
2. Non-consulting Services (contribution to JORDAN REEF)	0	6.5	6.5
3. Consulting Services	0.5	4.9	5.4
- Technical assistance for promotional wind farm	0.10	0.90	1.00
- Technical assistance for JORDAN REEF	0.04	0.36	0.40
- Policy and regulatory Framework	0.04	0.36	0.40
- Technical assistance for wind power integration	0.05	0.45	0.50
- Monitoring and evaluation	0.01	0.09	0.10
- Dev of business models & wind energy portfolio	0.05	0.45	0.50
- Public awareness campaign for RE development	0.14	1.26	1.40
- Capacity building in RE	0.11	0.99	1.10
4. Project management	0.11	0.21	0.32
Total Baseline Cost	17.5	123.9	141.5
Physical Contingencies	2.03	4.74	6.77
Price Contingencies	1.35	9.28	10.63
Total Project Costs¹	21.1	138.4	159.5

Component	2009	2010	2011	2012	Total
Wind farm & Associated Infrastructure	-	33.8	67.6	33.8	135.2
Transmission Line and Substation (to be financed by NEPCO)	-	0.3	7.7	4.4	12.4
Consulting Services	0.3	2.1	2.1	1.0	5.4
Contribution to JORDAN REEF	-	-	3.3	3.3	6.5
Total	0.3	36.1	80.6	42.5	159.5
<i>Counterpart Funding:</i>	<i>0.2</i>	<i>1.9</i>	<i>2.1</i>	<i>1.8</i>	<i>5.9</i>
<i>Jordan REEF</i>	-	-	1.8	1.8	3.5
<i>Renewable Energy TA</i>	0.1	0.9	0.1	0	1.0
<i>Market Development</i>	0.1	1.0	0.3	0	1.4
<i>Transmission Line and Substation</i>	-	-	-	-	-
<i>Consultancy and public awareness</i>	0.2	1.9	0.4	-	2.4

Annex 6: Implementation Arrangements

JORDAN: PROMOTION OF A WIND POWER MARKET

Partnership arrangements

The Government of Japan has provided funding through a PHRD grant to study various aspects of renewable energy development, including a barriers removal study. Wind energy is a specific component of the study. The Bank is working with AfD and French GEF on a related project for Energy Sustainability and Environmental Performance, which is expected to include GEF funding.

Institutional and implementation arrangements

The stakeholder roles and responsibilities will be as shown in the following table:

Project Coordination Unit (PCU)	<ul style="list-style-type: none"> • Responsible for launching the request for proposal for the promotional wind IPP power plant, and will administer the bidding and evaluation process • Coordinate the technical assistance component • Responsible for all fiduciary aspects of the project (procurement, financial management, etc.) • Responsible for overall coordination of the project.
Ministry of Energy and Mineral Resources (MEMR)	<ul style="list-style-type: none"> • Promulgating policy and preparing draft legislation with the assistance of consultants appointed under the project. • Raising awareness through workshops and meetings with other stakeholders • Implementing promotional activities, including taking the lead in selection of the promotional wind IPP • Channeling Government contribution to the JORDAN REEF • Project reporting (quarterly) • Disseminating information on wind energy and RE in general. • Technical assistance to service providers • Collaborating with ERC on tariff guidelines • Preparing RFPs, calling for and evaluating proposals for RE IPPs • Monitoring • Progress of RE investments • Financial management of GEF grant
Ministry of Planning and International Cooperation (MOPIC)	<ul style="list-style-type: none"> • Support MEMR in the overall coordination of GEF grant and project financial management
Ministry of Environment	<ul style="list-style-type: none"> • Approving environmental and social impact assessments and ensuring that ESMP are properly implemented • Assisting in identification of suitable wind farm locations • Taking the lead in consultations with affected people
Electricity Regulatory	<ul style="list-style-type: none"> • Approving tariff submissions

Commission (ERC)	<ul style="list-style-type: none"> • Collaborating with the JORDAN REEF and MEMR on tariff guidelines for RE • Approving and signing licenses • Arbitrating among players in the industry • Monitoring compliance with license conditions and performance standard
Land Owners	<ul style="list-style-type: none"> • Possibly, equity contribution to the RE businesses • Participation in planning of RE investment • Provision of security for RE infrastructure
Financial Institutions	<ul style="list-style-type: none"> • Possibly, equity contribution to the RE businesses • Appraisal, approval, provision and supervision of loans
JORDAN REEF	<ul style="list-style-type: none"> • Recommending procedures, guidelines, practices, criteria, etc, for providing subsidies • Operating a performance-based subsidy/grant mechanism • Collaborating with other financial institutions on the financing of RE projects
NEPCO	<ul style="list-style-type: none"> • Providing facilities for interconnection to the grid • Purchasing in bulk grid-connected renewable power • Proposing tariffs for RE to ERC and integrating RE in its generation mix.
Private Investors (actual and potential)	<ul style="list-style-type: none"> • Participating in capacity-building activities • Bidding for RE projects • Presenting unsolicited bids for RE projects • Signing agreements with JORDAN REEF, ERC and NEPCO • Building, operating and maintain RE projects

The Department of Renewable Energy in the MEMR will assume overall responsibility for managing the project on behalf of the client. It will be the first point of contact for the project sponsor. MEMR will coordinate with other institutions involved in the project, such as the proposed JORDAN REEF, land owners, project developers, NEPCO, ERC, etc. The Ministry will be responsible for launching the RFP for the wind farm component and will participate in the bid evaluation. It will also coordinate the TA component of the project and manage the performance-based subsidy/grant.

The Department of Renewable Energy has experience in implementing projects supported by the Bank and other financiers. It is currently managing consultancy assignments financed by the PHRD Grant, one of which is a preparatory activity for this project. MEMR, through the Department of Renewable Energy, will be responsible for all fiduciary aspects.

NEPCO will be the purchaser of the energy produced by the promotional IPP and will thus execute the PPA with the winning bidder. It will participate in several of the capacity building activities; in particular, review of the Electricity Law, planning, design and development of wind power and integration of wind power in power system operation.

The Electricity Regulatory Commission (ERC) will play a major role in amendment of the legal and regulatory framework to take account of the specific requirements for wind power, and renewable energy

in general. This work is being supported by ongoing preparatory work and will continue during project implementation.

The current Electricity Law requires approval of the first two IPPs and corresponding agreements (PPA, IA, etc) to be by the Cabinet. This procedure will be followed for the promotional investment, but the project will recommend subsequent approval procedures.

Annex 7: Financial Management and Disbursement Arrangements

JORDAN: PROMOTION OF A WIND POWER MARKET

Financial Management Assessment

I. Project Background

1. SCOPE. This is a desk assessment report of the financial management system of the Ministry of Planning and International Cooperation (MoPIC) for the proposed Promotion of Wind Power Market, conducted on March 19, 2008. The objective of the review is to determine whether the Project has in place an adequate financial management system as required by the World Bank under OP/BP 10.02.
2. The Projects Department of the MoPIC completed the FM Assessment Questionnaire, which provided the basis of the desk review (Attachment 1).
3. Objectives. The development objective of the project is to increase power supplied from renewable energy sources in a sustainable manner through the private sector and thereby help reduce the level of carbon emission from hydrocarbon-based power generation sources. The global environment objective is to reduce the GHG emissions by removing the barriers to the establishment of a sustainable wind energy market as well as integrate wind energy generation into the energy mix through the operation of a commercial wind farm in Jordan.
4. Project Costs. Total Project costs are estimated at US\$141.90m, of which US\$130m will be financed through an independent power producer (IPP). The total GEF financing of US\$6.00m will consist of support to the development of a market for renewable energy (US\$0.20m), the performance-based subsidy (US\$3.00m) and the technical assistance (TA-US\$2.80m)

II. Organization Structure Project Management

5. The overall implementation of the Project will be through a project coordination unit (PCU) under the Department of Renewable Energy in the Ministry of Energy and Mineral Resources (MEMR). The PCU will be responsible for coordinating the project on behalf of the client. The PCU consists of three key personnel: Project Coordinator, Procurement Officer, and a Financial Officer, who will be based on the MoPIC. Other personnel from MEMR's directorate responsible for renewable energy, in MoPIC and in National Electric Power Company (NEPCO), will assist the three members in various aspects of project coordination. The PCU will coordinate with other institutions involved in the project, i.e., the Jordan Renewable Energy and Energy Efficiency Fund (JORDAN REEF), land owners, potential investors and ERC, among others, in the preparation and procurement of the wind farm component and in implementation of the other two components prior to establishment of the JORDAN REEF. When established, the JORDAN REEF will be responsible for the technical assistance and project development activities, and for providing performance-based subsidies to projects which require them. The PCU will coordinate the technical assistance component and will be responsible for all fiduciary aspects. A suitable mechanism for channeling the performance-based renewable energy subsidy will be in place under the JORDAN REEF prior to disbursement of the subsidy funds. Annex 6 of the GEF Project Brief shows the roles and responsibility of each of the stakeholder .
6. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENT. The PCU is the primary unit responsible for the overall coordination and monitoring of the project with support from the MoPIC. The PCU, under the direction of a Project Director will be responsible for the day-to-day implementation of the project, including

carrying out procurement, disbursement activities, maintaining a sound financial management system through MoPIC and facilitating technical assistance.

III. Assessment of Existing Financial Management Arrangements at the Ministry of Planning and International Cooperation (MoPIC)

7. The purpose of the review of existing systems and internal controls of the MoPIC is to assess the adequacy of accounting system, procedures and controls and determine how these can be used and relied upon for the proposed project financial functions.

8. The MoPIC has a unit responsible for monitoring and supervision of Bank portfolio on behalf of the Government of Jordan. The unit is experienced on Bank's Guidelines and policies on disbursement and financial management. Staffs are qualified and experienced on the use of EXCEL software. This unit coordinates the replenishment of Designated Account as well as the counterpart funds, when applicable.

9. Overall, the financial management and computerized accounting system of the MoPIC is satisfactory. The computerized accounting and the financial management system is in place. The MoPIC/PCU will prepare and submit regular reports, in accordance with Grant Agreement; these reports include, Summary Sources and Uses of Funds by Financier and Category, Detailed Sources and Uses of Funds by Financier and by Component, which will automatically be generated from the computerized accounting system. The Statement of Expenditures and Designated Account Reconciliation Statement will also be generated. These reports comply with the requirements for transaction-based disbursement.

10. PROJECT FINANCIAL MANAGEMENT ARRANGEMENT. The PCU will follow the tax regulations issued by the GoJ. The PCU and MoPIC, will ensure that project financial management, including accounting functions and reporting activities, will utilize a computerized accounting system that will suit the project's components. The system will facilitate reporting of financial transactions and enable the Finance Officer to maintain accounting records, including receipt and disbursement of funds and commitments and accruals, in a timely manner. Some of the basic accounting records included in the computerized accounting system are the cash journal, bill register, consultant's ledger, etc. The availability of data from the computerized accounting system will help the PCU focus on meeting project management information needs

11. Project Accounting System. The Chart of Account that MoPIC usually sets-up for Bank's projects will be initiated. The MoPIC maintains a system (simple and easy to understand) for Bank's portfolio, which explains the accounting records and reports to be produced for the project.

12. CHART OF ACCOUNTS. MoPIC's Chart of Accounts (COA) enables data to be captured and classified by expenditure, project components and disbursement categories. It has a logical structure for recording financial transaction and has the capacity to classify and sub-classify accounting data. The COA enables data to be captured in a manner that will facilitate reporting of project-related expenditures by source, project component and expenditure category as indicated in the project documents (**Project Cost Tables**).

13. INTERNAL CONTROLS. MoPIC has its internal control in place based on the Government practice, with clearly written administrative, accounting and operational procedures that define levels of authority and responsibilities, ensure an orderly and efficient procurement and payment process, and properly record and safeguard project related assets and resources. There is a representative from MoF that verifies all supporting documents and provides clearance for payments, which is also done by a representative from the Audit Bureau. Specifically, the internal controls to be put in place includes:

- a process to identify and track sources of project financing, including the flow of funds and the timing of such flows (whether direct to the project or through government entities);

- a suitable authorization process for award of consultancy services, including documentation procedures, which are in compliance with World Bank policies;
- an appropriate segregation of duties and responsibilities, including invoice processing, accounting duties and payment functions;
- the design and use of standard forms for recording and controlling financial transactions;
- arrangement for storing projects documents and restricting access to authorized personnel only.

Overall, the internal control procedures ensure proper and consistent control over project funds and expenditures, permit the recording of financial transactions in a timely manner and present an accurate picture of project finances.

14. ACCOUNTING PERIOD. The Project will use the January-December accounting period of the Government.

15. PCU STAFF AND TRAINING. The training of the Finance Officer in MoPIC will include the preparation of withdrawal applications, which are sent to the World Bank. *The Finance Officer has to be recruited, and a job description will be prepared and submitted to the Bank prior to effectiveness.* The Procurement Officer will be recruited based on the TOR approved by **MoPIC and MEMR/PCU**.

16. DESIGNATED ACCOUNT AND CASHFLOW. MoPIC will open a Designated Account, where funds will be deposited from the Bank. The MoPIC/PCU will manage the Designated Account and is required to provide financial management reports to the Board of Directors of World Bank. All government accounts are maintained uniformly on a cash basis according to a chart of accounts prescribed under the unified governmental accounting system. For the PCU Designated Account, the chart of accounts will be established to comply with the standards used by GoJ for proper project financial management, to enable its system to show cost categories or commitments by contract. It will follow the financial accounting and tax regulations issued by the Government and the International Accounting Standards (IAS) rules and regulations, when applicable. The financial statements will be subject to external audits, which are to be carried out by the private local auditors.

17. RECORD MANAGEMENT. The files will be kept in MoPIC for two years from the closing date, after the last audit of the project. The management of records under this project would provide a paper trail on which the accounting system is based, and verification of financial transaction. For each financial transaction, an individual record should be created. Generally, records management should include:

- a. clearly defined procedures for creating and maintaining records;
- b. adequate backup arrangements;
- c. storage of financial records under lock and key, and safe from environmental risks (fire and water damage); and
- d. easy access for authorized personnel only;

18. The Interim Financial Reports (IFRs) formats will be developed and agreed upon at negotiations to suit the Project. The first IFRs will be produced within three months after the Project has been declared effective.

19. AUDIT REPORT. The audit report for period ending December each year will be submitted to the Bank within six months, every June 30th following the closing of the books.

20. The accounting records including the bank reconciliation statements for the semesters and year-end. MoPIC will set-up an escrow account for the audit fees to complete the audit of the project accounts by the closing date of the Grant. The escrow accounts will be closed within four months after the closing, when audit reports are completed and submitted to the Bank.

IV. Sources and Flow of Project Financing for the Promotion of Wind Power Project

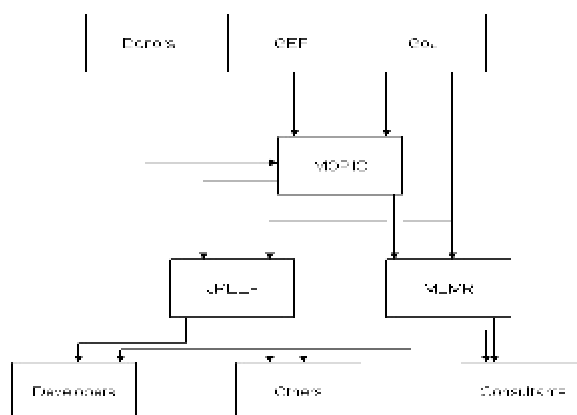
21. Financing of the proposed Project will be supported by GEF of US\$6.00m, consisting of support to the development of a market for renewable energy (US\$0.20m), the performance-based subsidy (US\$3.00m) and the technical assistance (TA-US\$2.80m).

22. COUNTERPART FUNDING. The government counterpart financing for the project will be in cash (JD5.0 m during the first three years of the project), which will be deposited at the Central Bank of Jordan. *MoPIC will include in its annual budget the cash requirement to ensure funds are available for the project.*

23. DESIGNATED ACCOUNT. For smooth project implementation, the Recipient would establish, maintain and operate a Designated Account in US dollars in the Central Bank of Jordan under conditions acceptable to the World Bank. The MoPIC, with the assistance of the Finance Officer will be responsible for administration of Designated Account and all Grant disbursements related transactions for the project. Only two signatures are required on any withdrawal application – that of the Project Director and one official from the MoPIC. Emphasis was made to the Recipient on World Bank general principle that other accounts should not be combined with World Bank funds in the Designated Account.

24. FLOW OF FUNDS. GEF will initially provide US\$3 million, for technical assistance and market development activities, both of which will be managed by a Project Coordination Unit (PCU) within MoPIC, but comprising members from MoPIC and MEMR. Requests for payment to consultants and other project beneficiaries will be made to MoPIC by the PCU. The second amount of US\$3 million shall become effective when the Renewable Energy Promotion Law is promulgated, the JORDAN REEF is operational and a FM system acceptable to the Bank is in place. The amount shall form part of the subsidy for the project and other renewable energy projects. Disbursements to the beneficiaries shall be subject to agreed performance criteria.

The diagram below shows the flow of funds.



25. The PCU will prepare the WAs accompanied by the related supporting documents, and signed by the Project Director as designated signatory, after review by the MoF auditor. The WAs are submitted to MoPIC Finance for review and signature of the MoPIC designated signatory.

V. Reporting Requirements.

26. FINANCIAL REPORTING. The PCU/MoPIC would coordinate the project activities of the proposed project; it would be responsible for consolidating and processing all reimbursement claims, as well as the submission of semi-annually IFRs. The Finance Officer would be responsible for producing a full range of financial statements and reports, including sources and uses of funds, Designated Account reconciliation statements, etc. In addition, a full set of semi-annually IFRs, as listed below, will be generated from the computerized accounting system for the semester beginning **September 2008**, and will be submitted to World Bank semi-annually (for the two Designated Accounts).

- i. a summary of funds received (showing funds received from the World Bank), and a summary of expenditures shown under the main project headings (i.e., project components) and by main categories of expenditures;
- ii. the *Accounting Policies Adopted and Explanatory Notes*. The explanatory notes should be presented in a systematic manner with items on the Statement of Cash Receipts and Payments being cross-referenced to any related information in the notes. Examples of this information include a summary of SOE Withdrawal Schedule, listing individual withdrawal applications; and

a *Management Assertion* that Bank funds have been utilized in accordance with the intended purposes as specified in the relevant World Bank legal agreement.

27. ANNUALLY. Audited project financial statements (PFS) would be submitted to the World Bank. PFS would include:

- a. Sources and application of funds/Cash Receipts and Payments (by components and expenditures categories) which recognizes all cash receipts, cash payments and cash balances controlled by the MoPIC/PCU;
- b. Expenditures by disbursement categories (Consultant's Services);
- c. Procurement process monitoring (Consultants Services). The formats of these reports would be agreed upon with World Bank and would be incorporated in the Manual.

Semi-annual IFRs should correspond with the annual financial statements that will be audited and submitted to World Bank. In addition, monthly bank reconciliation statements for the Designated Accounts would be prepared.

28. DISBURSEMENT ARRANGEMENT. Disbursements will commence using transaction-based method, including Statement of Expenditures (SOEs) and direct payment. The submission of interim financial reports will be on semi-annually basis.

VI. Auditing Arrangements, Accounting and Auditing Standards

29. AUDITING ARRANGEMENTS. The accounts and financial statements of the Project will be subject to annual audits. *The TOR for audit will be prepared and sent to the Bank for clearance prior to the first disbursement.* Financial statements for the Project will be prepared in accordance with IAS and audited by a private auditor under terms of reference and condition that are acceptable to World Bank. Annual audits of the Designated Account will be submitted to World Bank within six months following the end of the project's adopted calendar year (January-December)- the first such report will be due on **June 2009**.

30. Audits which will be comprehensive and cover all aspects of the Project, will include an examination of the project's financial statements, including:

- a. a statement of sources and uses of funds or balance sheet, indicating funds received and owed from all sources (World Bank/GEF) project expenditures on a cash basis;
- b. schedules classifying project expenditures by components and by categories reconciliation of the Designated Account statement as of year-end; and
- c. a statement of withdrawals made on the basis of SOEs.

31. TERMS OF REFERENCE (TORs) for the auditor. The TOR includes both an annual audit of financial transactions, and a "management letter" – an assessment of the financial management system, including the adequacy of internal controls. The draft TOR will be submitted to the Bank prior to the first disbursement for clearance. All implementing entities would provide the auditor with access to project-related documents and records, as required by the auditor.

32. The appointment of a qualified auditor under TOR acceptable to World Bank will be done within three month after effectiveness.

VII. Country Issues and Implementation Risks

33. COUNTRY ISSUES. The most recent Jordan ESW indicates that the country's fiduciary risk is rated moderate. There has been significant progress in its public financial management where Jordan has been able to: (i) improve its budget process through implementing a results based budget for the year 2008, (ii) advance the full implementation of a single treasury account with the Central Bank and (iii) modernize the spending procedures and accounting through adopting a new chart of account and developing the GFMIS for implementation by the MoF, government departments and other spending units. The GFMIS is still a work in progress and most of the ministries still do not have an accounting and reporting system in place.

34. The Bank has been working closely with other donors to assist the government in its public financial management reforms. For this purpose, the Bank conducted an Institutional Financial Management Capacity Assessment for two sectors in Jordan (Education and Social Development) to identify gaps in the financial management system at the central and sector levels as well as assess the associated risks on the use of public funds and planned modernization reforms. For the proposed GEF-financed project, MoPIC will handle the project's financial management and accounting system with a Finance Officer and the engagement of an independent qualified private audit firm acceptable to the Bank for yearly audit of the project.

35. The country governance risk is mitigated in this project with the financial management arrangement in place at MoPIC. The following country issues do not apply: (a) Quality and timeliness of audit reports as the audit will be conducted by a private firm of chartered accountants and based on the experience of MoPIC, this is not an issue; and (b) Project Financial Statements are to be generated.

VIII. Risk Analysis

36. FINANCIAL RISKS. The Project is exposed to potential risks involving the PCU staff assuming the authority and responsibility for every aspect of the project, thereby exposing it to possible risks of collusion and corruption. To mitigate this risk, (i) all payment orders will be signed by the Project Director, MoPIC Finance Officer and MoF staff assigned to MoPIC, (ii) the Project Director will certify that the services have been rendered before the payments are made by the MoPIC, and (iii) regular interim financial reports will be presented to the PCU. In addition, the complete segregation of duties among PCU staff will exist, i.e., the functions of implementing and overseeing will not reside with the same PCU staff. The project financial statements will be audited by an external private auditor, acceptable to World Bank.

37. OTHER RISKS. The issue of recruitment and retention of local qualified procurement and finance staff can pose a problem. To mitigate this, the PCU will engage staffs who are experienced in procurement, project management and financial management, with appropriate job descriptions included in the Manual of Procedures. The other risks are discussed in Attachment 1.

IX. Strengths and Weaknesses

38. STRENGTHS. The project has the following strengths in the area of financial management: (i) MoPIC has strong commitment and has been responsible for the accounting and financial management system of most Bank projects, in accordance with agreement ; (ii) there is a computerized accounting system already in place, and (iv) the PCU and MoPIC have experienced staff (Finance Officers) familiar with World Bank procurement and disbursement procedures.

39. WEAKNESS. The government salary is not at par with the public sector, and there is a possibility that the Finance Officer might be enticed to move to the private sector.

X. Readiness for Implementation

40. There is an existing satisfactory financial management system in place in MoPIC.

XI. Legal

41. The legal documents should ensure that all the requirements related to Financial Management System are covered. An example of the legal financial covenant is shown below:

Section 2.05. **Financial Management.** (a) The Recipient shall cause the Implementing Entity to ensure that a financial management system is maintained in accordance with the provisions of Section 2.07 of the Standard Conditions.

(b) The Recipient shall cause the Implementing Entity to ensure that interim unaudited financial reports for the Project are prepared and furnished to the World Bank not later than one month after the end of each calendar semester, covering the semester, in form and substance satisfactory to the World Bank.

(c) The Recipient shall cause the Implementing Entity to have its Financial Statements for the Project audited in accordance with the provisions of Section 2.07 (b) of the Standard Conditions. Each such audit of the Financial Statements shall cover the period of one fiscal year of the Recipient. The audited Financial Statements for each such period shall be furnished to the World Bank not later than six months after the end of such period.

XII. Supervision Plan

42. The first supervision would take place within three months of effectiveness, to ensure that the financial management system put in place is operating according to plans. A good project Supervision Plan should ensure review of the following information, which should be readily available :

- (i) Financial forecasts for the life of the project broken down by appropriate period, from which the annual budgets for the project should be developed;
- (ii) A procurement plan, including the activities and processes associated with the project (for instance, arrangements and process to secure the services of consultants);
- (iii) The format and content of, and the auditing arrangements for, project financial reports;

43. The mission should evaluate the progress of the development of interim financial reports, the consultant's work and other related FM issues, i.e., Designated Account, internal control, work and document flow, etc. The mission would conduct a random review of the Designated Account, SOEs, compliance with the financial covenants, disbursements, financial record management, changes in procedures related to IFRs, etc.. In total, at the minimum, there should be two supervision missions a year.

XIII. Agreed Actions

44. Next Steps. It was agreed that the TOR for the audit will be prepared and submitted to the Bank prior to the first disbursement (para. 28).

45. The recruitment of the Finance Officer and related job description will be completed prior to project effectiveness (para. 15).

Attachment 1

<i>Risk factors</i>	<i>Description of risk</i>	<i>Rating^a of risk</i>	<i>Mitigation measures</i>	<i>Rating^a of residual risk</i>
Financial Management	<p>This project is related to a PHRD grant that supported resource assessment in renewable energy (wind, geothermal energy, etc.) including the design of a legal and regulatory framework. The procedures adopted for the PHRD grant will be applied to this GEF-financed Project. The Project consists of TA component primarily for consultancy services, which is only a small component combined with other components with various financiers. There is a risk that some of these FM and accounting procedures are not applicable to this follow-up project and could delay payment processing. There is also a risk that some of the expenditures financed from the project could be duplicated in other expenditures financed from other sources, if there is no proper accounting procedure in place.</p>	Moderate	<p>Coordination between the PCU and MoPIC has been agreed upon between all parties; the procedure follows the same system utilized under the PHRD grant for the assessment of renewal energy, including the wind power, but with some revisions to be agreed upon with the Bank. A simplified Manual of Procedures will be issued prior to the first disbursement to indicate the accounting process and procedures for the funds from various sources. The internal controls will also be discussed in the Manual, identifying the signatories for payments and withdrawal applications, documentation, record-keeping, etc.</p>	Low
	<p>The support for renewable energy fund is a combined financing of the Bank/GEF and the GoJ, under the Jordan Renewable Energy and Energy Efficiency Fund (JORDAN REEF). The subsidy would be disbursed based on performance; however the PAD indicates this would be disbursed early in the project, provided a bank guarantee is given by the developer. There is a risk of duplicating the subsidy provided by GoJ.</p>	Moderate	<p>No disbursement of the US\$3 million will be done until the financing mechanism agreed by the Bank has been developed.</p>	Low to Moderate

ATTACHMENT 2

Financial Management Assessment Questionnaire

Project : Promotion of Wind Power Market

FMAssessment completed by : Josephine Masanque

Date : March 19, 2008

Bank Review/Assessment completed by : March 19, 2008

Responses Provided by:

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1. BUDGET

1.1 Are the project plans and budgets realistic, based on valid assumptions and developed by knowledgeable individuals?

Yes, the estimates are based on prior consultancy work, such as for feasibility studies of the wind farm and for setting up of the JORDAN REEF.

1.2 Are procedures in place to plan project activities and prepare related budgets, and to collect information from the units in charge of the different components?

Procedures are in place. Moreover, the main beneficiary of the project will be the renewable energy department in MEMR, whose head is a members of the project coordination unit.

1.3 Are budgets prepared for all significant activities in sufficient detail to provide a meaningful tool with which to monitor subsequent performance?

Budgets have been prepared for all project components.

1.4 Are approvals for variations from the budget required in advance?

Yes, but that can be done easily.

2. ACCOUNTING

2.1 Does the entity adopt acceptable national/international accounting standards?

Yes, MOPIC will be responsible for accounting procedures. MOPIC is responsible for the financial management of a large no. of similar projects.

2.2 Are there written policies and procedures covering all routine accounting and related administrative activities?

Yes, and those are followed in MOPIC.

2.3 Is the accounting function staffed adequately with experienced and qualified persons? (Attach organizational chart, job descriptions etc.)

Yes, head of accounting division at MOPIC is a member of PCU.

2.4 Is the chart of accounts adequate, or can it be adapted to properly account for, and report on, all project activities?

Yes, MOPIC has a good experience in this regard.

2.5 Is the accounting/reporting system computerized? If not, are the manual systems adequate to account for project activities in a timely manner?

Accounting system is computerized.

3. INTERNAL CONTROLS

3.1 Are approval and authorization controls in place and properly documented?

Yes, and this is usually documented.

3.2 Do policies and procedures clearly define conflict of interest and related party transactions (real and apparent) and provide safeguards to protect the organization from them?

Yes

3.3 Are bank reconciliations prepared by someone other than those who process or approve payments? Are all unusual items on the bank reconciliation reviewed and approved by a responsible official?

Yes, Financial auditor of the Ministry of Finance

3.4 Are memorandum records of fixed assets and stocks kept up to date and reconciled with control accounts? Are assets sufficiently covered by insurance policies?

Yes, and this is usually followed by the internal audit unit.

3.5 Is the internal audit function effective – are actions taken on the audit findings?

Yes, that is usually followed by the Minister.

4. FUNDS FLOW

4.1 Does the entity have any previous experience of Bank's disbursement procedures?

Yes, MOPIC and MEMR have implemented the recently closed PDF -B grant for the same project. The same individuals will be responsible for the project.

4.2 Are the arrangements to transfer the proceeds of the loan (from the government / ministry of finance) to the entity and from the entity to each of the implementing units satisfactory and in compliance with the Bank's disbursement policies and procedures?

The funds will not be transferred. As for the PDF -B grant the funds will remain in MOPIC and implementation will be by a unit comprising MOPIC and MEMR staff.

4.3 Are the beneficiaries required to contribute to project costs? If beneficiaries have an option to contribute in kind (in the form of labor), are proper guidelines formulated to record and value the labor contribution?

Beneficiaries will be required to provide a counterpart funding, and that was discussed with them already, so that they can plan accordingly.

5. FINANCIAL REPORTING

5.1 Has the project established & documented financial reporting responsibilities that specify what reports are to be prepared, when they are to be prepared, periodicity of preparation and content?

The project will follow the procedure that MOPIC follows, and those are the same procedures used for a large no. of projects including World Bank projects.

5.2 Are financial reports used by management?

The management regularly uses the financial and internal audit reports to monitor and follow up.

5.3 Do the financial reports compare actual expenditures with budgeted and programmed allocations?

Yes, this is part of monitoring and follow up report that is prepared periodically.

6. EXTERNAL AUDIT

6.1. Is the entity financial statement audited regularly by an independent auditor? Who appoints the auditor?

Financial statements of all projects are audited, sometimes the audit bureau conducts the auditing or an independent auditor is appointed according to the procedures established by the audit bureau.

6.2 Are the audit reports up to date?

Those are updated annually/mid-term/upon completion.

6.3 Is the audit of the entity conducted in accordance with international standards on auditing or other acceptable standards?

Yes, audit bureau follows the international standards.

6.4 Were any major accountability issues identified in the audit report of the past three years?

No

6.5 Has the project prepared acceptable terms of reference for an annual audit?

Those are in place for this project and other similar projects.

Staffing : Does the PCU have suitable staffing for financial management?

Yes

Annex 8: Procurement Arrangements

JORDAN: PROMOTION OF A WIND POWER MARKET

General

Procurement for the proposed project will be carried out following the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits, dated May 2004"; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers, dated May 2004"; and provisions stated in the Legal Agreement and the Project Operational Manual. Procurement arrangements for the various components are described in general below. For each contract to be financed by the Grant, the different procurement methods, estimated costs, prior review requirements, and timeframe are agreed between the Borrower and the Bank as presented in the Procurement Plan which will be updated at least annually.

Procurement of Wind Farm Developer under BOO

The largest component to be procured under the project is a 60-70 MW wind farm to be developed as an IPP. It will be procured under international bidding procedures in accordance with Section 3.13(a) of the Guidelines. For this component the GEF financing will be applied only towards the purchase of energy by NEPCO in the form of a fixed amount subsidy/grant.

Employment of Consultants

Consulting services to be contracted under the project include studies under the TA and Project Development Support components. Consultants will be selected in accordance with "Guidelines: Selection and Employment of Consultants by World Bank Borrowers, published in May 2004", and the agreements in the Procurement Plan. For Project Development Support, where a project developer has been selected in accordance with competitive procedures agreed to in advance with by the Bank, well-established private sector or commercial practices acceptable to the Bank may be used.

Selection of *Firms* will be through QCBS procedures, except for small assignments of a standard and routine nature and estimated to cost less than US\$100,000 equivalent, which would be procured through Consultant Qualifications, Least Cost Selection or other selection methods as defined in the Legal Agreement and the Procurement Plan.

Selection of *Individuals* will be through the comparison of qualifications of at least three qualified candidates, as provided in paragraphs 5.1 to 5.3 of the Guidelines.

Procurement Plan: The MEMR submitted a procurement plan (PP) for the project implementation; this will be reviewed and agreed upon during the negotiations. The PP will be available at the office of the PCU. It will be also available in the project data base and in Bank's external website. The PP will be updated in agreement with the Bank's Task Team annually or as required .

Prior Review Thresholds : The PP shall set forth those contracts which will be subject to the Bank's prior review process. All other contracts shall be subject to post review.

Procurement Capacity Assessment

Procurement activities under the project will be carried out by a dedicated Project Coordination Unit (PCU) which has been established under the Department of Renewable Energy in the Ministry of Energy and Mineral Resources (MEMR). The PCU will bear the overall responsibility for the entire procurement activities under the project including scheduling, bidding and request for proposals documents, bid and proposals evaluation, award decision, contract signing, contract management and maintain a complete procurement tracking and filing system.

As a part of project preparation, an assessment of the capacity of the MEMR and PCU to implement procurement activities under the Project was carried out by the Bank in December 2007. It has concluded that MEMR has experience in procurement following Bank Guidelines and ICB procedures acceptable to the Bank. For instance, it has carried out procurement for four ongoing consultancy activities financed by a PHRD grant, the PDF-B activities and the Amman East Power Plant (IPP) following Bank Guidelines or procedures agreeable to the Bank. Additional procurement training would be delivered before effectiveness and would target the PCU procurement officer as well as selected members of the Special Tender Committee. The procurement risk was assessed as Average.

Project Costs by Procurement Category

Expenditure Category	Procurement Method ⁹			Total
	ICB	NCB	Other ¹⁰	
1. Supply and Installation			130.00	130.00
			(0.00)	(0.00)
2. Goods		0.00		0.00
		(0.00)		(0.00)
3. Non-consulting services ¹¹			6.50	6.50
			(3.00)	(3.00)
4. Consulting services			5.40	5.40
			(3.00)	(3.00)
Total		0.00	141.90	141.90
		(0.00)	(6.00)	(6.00)

Advertisement : A General Procurement Notice shall be published in the online edition of DgMarket and Development Business upon Board presentation. Requests for Expression of Interest for consulting assignments with firms exceeding the value of US\$200,000 shall be published in at least two National dailies of a wide circulation and the on-line edition of the DgMarket/UNDB.

⁹ Figures in parentheses are the amounts to be financed by the GEF grant.

¹⁰ Includes procurement of goods, training, services and consultant services, and supply and installation of wind power plant through BOT.

¹¹ Includes subsidy

Procurement Information and Documentation – Filing: Project procurement information will be recorded and reported as follows:

- (a) Complete procurement documentation for each contract, including bidding / RFP documents, advertisements, bids/proposals received, bid/proposals evaluations, contract agreements, securities, related correspondence etc., will be maintained by the PCU in an orderly manner, readily available for audit;
- (b) Contract award information will be promptly recorded and contract rosters as agreed will be maintained by the PCU; and
- (c) Quarterly reports by PCU indicating:
 - i. status of on-going procurement, including a comparison of originally planned and actual dates of the procurement actions; and
 - ii. Updated procurement plans, including revised dates, where applicable, for the procurement actions.

Annex 9: Economic and Financial Analysis

JORDAN: PROMOTION OF A WIND POWER MARKET

Project Economic Analysis

The economic analysis assesses the benefits and costs to Jordan from developing a 65 MW promotional wind farm capable of supplying about 200 GWh of electricity annually to Jordan's interconnected system.

Economic benefits are derived from the economic value of electricity generated, where the electricity tariff is assumed to be US\$0.07/kWh – the projected interconnected system power plant tariff to NEPCO in 2011 (commercial operation of the wind farm) that assumes an economic price of natural gas of US\$5.5/MMBtu for gas-fired power plants. A performance-based subsidy/grant of US\$2.8 million (funded by GEF) is assumed to be earmarked for the promotional wind farm and included as an economic benefit as it reflects global willingness to pay for the wind farm¹². The promotional wind farm will contribute in GHG emission reduction equivalent to about 90,000 tons of CO₂ annually.

Economic costs include the US\$118 million estimated installed economic cost of the promotional wind farm, excluding taxes, import duties, interest expenses or price contingencies. Operating costs include the estimated fixed operating cost (US\$23/kW of installed capacity) and variable (US\$0.0125/kWh of generated electricity) of the wind farm; the present value of such costs amount to US\$25.6 million over the life of the project.

Based on these economic costs and benefits, the EIRR of the project is 5% in the base case. The analysis result underscores the higher development cost of wind power generation in Jordan due to (i) the higher cost of wind equipment at present, and (ii) the availability of low-price natural gas that helps keep the economic value of electricity generated in Jordan lower than some other countries. Sensitivities analysis on selected variables yields the following results:

Scenario	EIRR (%)
Base case	5 %
a) Construction cost -15%	7 %
b) O&M cost -15%	6 %
c) Capacity factor increases to 40% from 35%	7 %
d) Economic tariff increases to 9 cents from 7 cents	9%

Project Financial Analysis

¹² In accordance with OP10.04 – Economic Evaluation of Investment Operations, paragraph 8.

This section presents an analysis of financial aspects related to the proposed promotional wind IPP to be located at Fujeij. A cash flow model was developed for this purpose.

Project income is derived from electricity payments over the project's lifetime (20 years). There is also a one time subsidy/grant payment of US\$2.8 million in the first year of construction. Financial outflows relate to operating expenses, interest and repayment of loans. Actual figures and other general assumptions used for the financial model are summarized in Table 1 below.

The project's capital costs are financed using a standard limited recourse financing arrangement common for this type of projects in Jordan with 30% equity and 70% debt. For the debt portion of the financing plan, an interest rate of 7.5% is assumed. Debt service coverage ratios are maintained to exceed 1.1 during the loan term.

To evaluate the financial feasibility of the project, both the net present value (NPV) and the internal rate of return (IRR) to the project and to the equity investors have been calculated. At the project level, the NPV at 10% discount rate is about US\$17 million and the project IRR is about 12%. In addition, the NPV and the rate of return to equity investors are respectively US\$27 million and 15%. The corresponding levelized financial tariff at commercial operation is estimated to be about 12 US cents per kWh. The full cash-flow analysis for the project is presented in Table 2.

The results of the sensitivity analysis show that the project is highly sensitive to some critical variables such as: (a) investment costs; (b) discount rate; and (c) the level of tariff

Table 1: Financial Analysis Assumptions

GENERAL					
Nominal Capacity				68	MW
Rated Capacity				65	MW
Net Capacity Factor				35.2	%
Operating hours at full capacity				3084	hours per year
Electricity Produced				200.43	GWh per year
Start Construction				2009	Calendar Year
project Lifetime				20	Years
Capital Cost				\$2,000	\$/kW
Total project Cost				\$130,000,000	
4 years disbursement	25%	30%	45%		0%
FINANCING					
Debt Contribution in Financing				70%	
				Loan 1	
Amount				\$91,000,000	
Interest Rate				7.5%	
Term (year)				10	
Equity (\$)				\$39,000,000	
Debt (\$)				\$91,000,000	
Minimum Debt Service Coverage Ratio				1.2	
EXPENSES					
Fixed Operation and Maintenance (O&M)				23	\$/kW
Variable O&M				0.0125	\$/kWh
Tax Rate (percent of Net Income)				0%	
Insurance				0.20%	Value of equipment \$80,000,000
DEPRECIATION					
Percentage that can be depreciated				100	
Straight line Depreciation				20	Years
INCOME					
Initial Electricity Price				0.096	\$/kWh
GEF Subsidy/Grant				2.8	\$/Million

Table 2: Cash Flow Analysis

Year GWh	US dollar Million			3.5% escalation factor																				
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
Cash Inflows																								
Rev. from electricity to grid				19.26	19.94	20.64	21.36	22.11	22.88	23.68	24.51	25.37	26.25	27.17	28.12	29.11	30.13	31.18	32.27	33.40	34.57	35.78	37.03	
Total Revenues				19.26	19.94	20.64	21.36	22.11	22.88	23.68	24.51	25.37	26.25	27.17	28.12	29.11	30.13	31.18	32.27	33.40	34.57	35.78	37.03	
Cash outflows	32.50	39.00	58.50	4.16	4.31	4.46	4.61	4.77	4.94	5.11	5.29	5.48	5.67	5.87	6.07	6.29	6.51	6.73	6.97	7.21	7.47	7.73	8.00	
Investment Costs:																								
Fixed assets	32.50	39.00	58.50	0.00																				
Operating costs																								
Fixed O&M				1.50	1.55	1.60	1.66	1.72	1.78	1.84	1.90	1.97	2.04	2.11	2.18	2.26	2.34	2.42	2.50	2.59	2.68	2.78	2.87	
variable O&M				2.51	2.59	2.68	2.78	2.87	2.98	3.08	3.19	3.30	3.41	3.53	3.66	3.79	3.92	4.06	4.20	4.34	4.50	4.65	4.82	
Insurance				0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	
Total Operating Costs				4.16	4.31	4.46	4.61	4.77	4.94	5.11	5.29	5.48	5.67	5.87	6.07	6.29	6.51	6.73	6.97	7.21	7.47	7.73	8.00	
Net cash flow before financing	-32.50	-39.00	-58.50	15.10	15.63	16.18	16.75	17.33	17.94	18.57	19.22	19.89	20.58	21.31	22.05	22.82	23.62	24.45	25.30	26.19	27.11	28.05	29.04	
Add loan/grant disbursement	25.55	27.30	40.95																					
Less loan services	0.85	2.73	5.29	15.58	14.90	14.22	13.54	12.85	12.17	11.49	10.81	10.12	9.44											
Net Cash flow after financing	-7.80	-14.43	-22.84	-0.48	0.73	1.96	3.21	4.48	5.77	7.08	8.41	9.76	11.14	12.51	13.91	15.34	16.80	18.29	19.81	21.36	22.94	24.55	26.19	
NPV Project @10% discount rate	17.21	US\$million																						
IRR	11.8%																							
NPV Equity @10% discount rate	26.56	US\$million																						
IRR	14.8%																							
PV of GWh @ COD	1703																							
PV of Revenues @ COD	209																							
Levelized financial tariff @ COD	0.123	US\$ / kWh																						

Financial Analysis of the Electricity Sector

The electricity sector continues to remain financially viable and operates without explicit cash subsidies from the Government budget. The sector comprises primarily of 2 generating companies CEGCO (2006 assets JD513m, sales JD257m, net loss JD1.9m, installed capacity 1,747 MW) and Samra (assets JD112m, net loss JD1m, installed capacity 300 MW), 1 single-buyer transmission company NEPCO (assets JD517m, sales JD506m, net income JD95,633), and 3 regional distribution companies JEPCO (assets JD316m, sales JD273m, net income JD16m for greater Amman area), EDCO (assets JD174 m, sales JD73m, net loss JD1.4m for southern Jordan) and IDECO (assets JD83 million, sales JD58m, net income JD0.9m for northern Jordan). The average bulk supply tariff to distribution companies and wholesale consumers was JD0.035/kWh in 2006 (US\$0.050), a slight increase from JD0.034 in 2005 (US\$0.049). The average power plant tariff to NEPCO was JD0.032/kWh in 2006 (US\$0.045), up from JD0.031 in 2005 (US\$0.044).

The major supporting factors of financial viability include: (i) fuel switching of major power stations to using favorably-priced natural gas import from Egypt (started in 2003) that helps reduce generation cost; (ii) the introduction in June 2005 of differential tariffs between NEPCO and the distribution companies through formal bulk supply agreements to reflect the less favorable consumer mix among the three distribution companies; (iii) low transmission loss (3%) and improving distribution losses (10-13%); (iv) the partial use of the Rural Fils funds towards subsidizing fuel costs and capital expenditures (a fund that collects 2 fils per kWh of electricity consumed to support rural electrification and other expenses by the sector—the amount collected in 2006 was about JD 18 million, half of which was provided to CEGCO to subsidize the cost of fuel); and (v) the year-end adjustment of the tariff between CEGCO and NEPCO to ensure that both companies remained profitable.

Recent financial performance of the electricity companies can be summarized as follows. For generating companies, CEGCO has been operating on a cost recovery basis with small profitability. In certain years, extraordinary items (such as loss on foreign exchange) push CEGCO into a net loss position. CEGCO has benefited from subsidy on fuel price (JD9.3m in 2006 for heavy fuel oil and diesel), which helps reduce its cost of electricity generation. In 2006 CEGCO was under the final stage of privatization with work underway to finalize the terms of the power purchase agreement, including an adjustment to capacity charge and energy charge. Pending privatization, CEGCO has made no major capital expenditure in recent years. The privatization process was completed in October 2007 with CEGCO and NEPCO entered into five separate power purchase agreements. Samra achieved full commercial operation of its 300 MW combined-cycle facility in 2006 and generated 1,660 GWh for the year. As a newly start-up single asset company, Samra recorded a loss of JD 1 million (2005) and a profit of JD 1.9 million (2006). There is a plan to expand Samra capacity to 600 MW.

For the transmission company, NEPCO has been operating as a single-buyer on a cost recovery basis with small profitability. In 2006 electricity sales grew 15% year-on-year (GWh sold grew 11% and average tariff increased 3%), reflecting strong economic growth (real GDP grew 6.4% in 2006) and the

influx of immigrants to Jordan¹³. Operating expenses are in line with prior years (95% of sales), comprising mostly of the cost of electricity (66% of sales) and the cost of Egypt natural gas¹⁴ (25% of sales). Other expenses remain small, including maintenance, administrative, financing costs and depreciation. NEPCO made a small net profit of JD95,633, a slim net profit margin of 0.02% of sales. A notable positive development is the substantial improvement in bill collection: average receivable reduces to 51 days (2006) from 66 days (2005) and 73 days (2004). The average payment period to power generators is 77 days (2006) vs 68 days (2005), while that to gas suppliers is 39 days (2006) vs 37 days (2005). Operating cash flow reached JD49.7 million (2006), an equivalent operating cash flow margin of 9.8% of sales. Of this amount JD31 million was spent on capital expenditures, a substantial amount equivalent to 7.6% of fixed assets at the beginning of the fiscal year. Outstanding long-term debt exceeds operating cash flow by 3 times, reflecting the company's conservative leverage position.

For distribution companies, JEPCO is the largest of the three and its current favorable concession term¹⁵ provides adequate margin that ensures profitability for the company. Despite paying the highest bulk supply tariff, net profit margin increased to 6% (2006) from 4.5% (2005 & 2004). EDCO is the second largest and the least profitable of the distribution companies. It has the lowest gross margin on electricity sales¹⁶ (8% lower than JEPCO and 4% lower than IDECO in 2006), reflecting the less favorable consumer mix in its coverage area. This lower margin is enough to incur the company a net loss of JD1.4 million, a 2% net loss margin. IDECO is the smallest and its profitability has recently improved as a result of the differential bulk supply tariff and its ability to control other operating costs. Its net profit margin improved to 1.5% (2006) from 1.2% (2005) and -1.6% (2004).

The key financial risks facing the sector include:

The price and availability of natural gas: Under the current contract, the price of the contracted Egyptian gas will not change until the end of 2012. Beyond this, the price of natural gas is expected to increase from its current level and be linked to international oil prices, but the contract includes a floor and a ceiling price for up to about 1.5-3 billion cubic meters (bcm) of natural gas annually. In 2006, CEGCO power plants used 1.55 bcm of Egypt natural gas and Samra used 0.43 bcm. The Amman East Power Plant is expected to consume 0.58 bcm upon reaching full commercial operation in 2009. According to NEPCO, the quantity of Egyptian natural gas is expected to be adequate for another 2 IPPs, one of which is the proposed Al Qatrana Power Project.

Ability to pass on rising generation cost: The ERC is reviewing the bulk supply contracts and the distribution tariffs with a view of introducing automatic fuel adjustment clauses or other

¹³ Authorities estimate the minimum number of Iraqis that settled in Jordan to be 300,000, equivalent to a 6% increase in the resident population.

¹⁴ NEPCO is the fronting agency in purchasing Egypt natural gas and selling to the generating companies. Currently, NEPCO makes no profit from this activity; the cost of natural gas to NEPCO is the same as the natural gas tariff paid by the generating companies – a pass-through arrangement.

¹⁵ JEPCO's current concession permits an annual return on paid-up capital of 7.5-16%.

¹⁶ Gross margin on electricity sales (JEPCO 21%, EDCO 13%, IDECO 17% (2006); JEPCO 23%, EDCO 13%, IDECO 14% (2005)).

suitable mechanisms to pass on the rising generation cost to consumers. It is the intention of the GoJ to maintain the first 160 kWh of residential tariff unchanged at 31 fils/kWh (US\$ 0.044), slightly below the 2006 average bulk supply tariff of 35 fils/kWh paid by distribution companies.

Bills collection: The recent improvement in bills collection is very positive with the most improvement coming from the largest distribution company JEPSCO. There is still considerable room for improvement from EDCO and IDECO¹⁷. The improved collection discipline is a good preparation for the future IPPs (e.g. Amman East Power Plant), where the PPA requires bill payment to be made within 30 days of invoice date.

Distribution company's performance: Specifically, EDCO's gross margin on electricity sales could be improved through improving distribution losses (13% in 2006) and further refinement of the differential bulk supply tariff. The previously mentioned bill collection improvement should remain a top priority for the company. Good improvement in collection from governmental customers was seen in 2006, but challenge remains for other customer groups.

Foreign currency exposure: All electricity companies are exposed to foreign currency fluctuations. This includes, inter alia, foreign-currency debt obligations¹⁸, foreign costs such as fuels and imported equipment, and foreign-currency denominated electricity tariff. Even though the Jordanian Dinar is pegged to the US Dollar and work is under way to implement an automatic electricity tariff adjustment mechanism, it is advisable for electricity companies to put in place a foreign currency protection strategy to protect against adverse currency devaluation.

Sector Financial Outlook

A financial projection of the sector indicates a rising cost of electricity to NEPCO and consequently to the end-users following the privatization of CEGCO. The average purchased electricity tariff by NEPCO is projected to increase from JD0.032/kWh (US\$0.045) in 2006 to an average of JD0.054/kWh (US\$0.077) in 2008 when the post-privatized CEGCO tariffs become effective. Higher post-privatization capacity charges of CEGCO's power plants and the higher fuel cost contribute significantly to this increase. In light of the increase, the bulk supply tariffs are expected to be adjusted during 2007 to smooth out the impact of the increase. The impact of the average tariff increase is projected to slightly decline, to about JD0.049/kWh (US\$0.07), in the following five years due to more electricity being supplied by lower-tariff power plants such as Samra and the new IPPs.

At the distribution tariffs level it will be necessary to incorporate the details of EDCO and IDECO privatization, which is not available at this time. It is likely, however, that the distribution tariffs will have to be increased due to the double impacts of the rise in the average generation tariff and of the privatization of the distribution companies. It will be crucial to monitor end-users tariff adjustment in the coming years as this will impact the financial performance of the electricity companies.

¹⁷ Average payment period of electricity bills to NEPCO: JEPSCO 41 days (06) vs 70 days (05), EDCO 123 days (06) vs 133 days (05), IDECO 87 days (06) vs 95 days (05).

¹⁸ Foreign currency loans as a % of total loans: CEGCO 62%, Samra 100%, NEPCO 74%, JEPSCO 78%, IDECO 16%, EDCO outstanding loan is negligible.

NEPCO: Summary Financial Statements and Financial Ratios

JD'000

Balance Sheet	2003	2004	2005	2006
<u>Assets</u>				
Cash	8,004	1,818	5,857	6,968
Current assets, net	62,857	89,498	85,708	83,883
Fixed assets, net	349,290	378,850	407,395	419,765
Total assets	433,931	476,854	506,056	517,494
<u>Liabilities & Equities</u>				
Current liabilities, net	67,081	105,255	112,237	122,236
Long-term liabilities, net	139,111	148,070	172,009	173,184
Total liabilities	206,192	253,325	284,246	295,419
Paid-in capital	230,000	230,000	230,000	230,000
Total equity	227,736	223,524	221,812	222,074
Income Statement				
<u>Revenue</u>				
Electricity	278,180	357,389	404,304	505,983
Gas & others	263,215	291,090	327,100	375,268
	14,955	66,299	77,204	130,714
<u>Expenses</u>				
Electricity	231,650	255,333	295,755	336,117
Other operating expenses	22,919	76,389	89,491	143,016
Financing	5,717	6,118	7,223	7,951
Depreciation	11,417	13,122	14,895	17,389
Net income (loss)	3,760	1,788	(2,924)	96
Cashflow Statement				
Operating cashflow	7,301	13,225	18,176	49,701
Investment cashflow	(25,846)	(37,867)	(44,563)	(31,418)
Financing cashflow	8,419	18,456	30,426	(17,172)
Change in cash	(10,127)	(6,186)	4,039	1,110
Beginning cash balance	18,131	8,004	1,818	5,857
Ending cash balance	8,004	1,818	5,857	6,967
Financial Ratios				
<u>Profitability</u>				
Electricity margin (sales)	12.0%	12.3%	9.6%	10.4%
Gross margin	8.5%	7.2%	4.7%	5.3%
Net margin	1%	1%	-1%	0%
Average selling tariff (JD/kWh)	0.0330	0.0332	0.0342	0.0353
Average buying tariff (JD/kWh)	0.0291	0.0291	0.0310	0.0316
Electricity loss @ NEPCO	3.8%	3.6%	3.5%	3.2%
<u>Assets utilization</u>				
Debt service coverage ratio	1.3	1.4	1.0	1.1
Self finance (cash basis)	0.3	0.3	0.4	1.6
Current ratio	1.1	0.9	0.8	0.7
Maintenance/Gross fixed assets	0.6%	0.7%	0.9%	0.4%
Receivables day	60	73	66	51
Payables day	55	74	61	66
Total liabilities to equity	0.9	1.1	1.3	1.3

Annex 10: Safeguard Policy Issues

JORDAN: PROMOTION OF A WIND POWER MARKET

Environmental

Consultants carried out an assessment of the potential environmental and social impacts associated with a wind farm to be located on land to the north-east of the town of Shawbak. The wind farm would comprise a number of wind turbines yet to be determined, access roads, a control building and substation and overhead power line connection to the existing substation to the east of the Rhashadya cement works. The proposed wind farm would be located on land that is currently unused and which is entirely owned by the Ministry of Agriculture.

The report of the study shall be provided to potential developers of the wind farm to assist with the bidding and to assist the selected bidder with the preparation of the Environmental and Social Impact Assessment (EIA) for the project. In undertaking the assessment, consideration was given to alternative forms of technology and an assessment was made of the institutional ability of the various ministries to regulate the emerging wind energy market in Jordan. The work also included the preparation of an outline environmental and social monitoring and mitigation plan (EMMP) and a public consultation plan for adaptation and use by future project developers. A screening tool was also developed to help inform developers of the typical constraints associated with wind farm projects.

The assessment was preceded by a scoping and consultation exercise undertaken to identify the potential environmental issues associated with the construction, operation and decommissioning of the proposed wind farm and how these should be addressed. The study also endeavored to establish the relevant Jordanian, World Bank and International Finance Corporation (IFC) limits, standards and guidance, where relevant supplementing these with wind industry best practice standards.

Overall, the assessment found none of the potential impacts to be major. The following tables present the potential environmental and social impacts during construction and operation, and the corresponding mitigation measures.

Construction impact mitigation, monitoring, and management measures

Concern	Significance	Mitigation Measure	Monitoring
Air Quality			
Dust creation from soil movements, emissions from vehicles etc	Moderate	A Water Bowser will be used if required (following tests to determine the moisture content of material) Excavation faces not being worked will, if required, be either sheeted or treated with a chemical dust suppressant All operatives working in areas of potential dust emission will be	To ensure that atmospheric dust, contaminants or dust deposits generated by the construction do not exceed levels which could constitute a health hazard or nuisance to those persons working on the site or living nearby a dust

		provided with paper facemasks. All stockpiles will be located away from sensitive receptors wherever possible. Materials deposited on stockpiles on site will be closely monitored for any possible emission of dust and if required they will be damped down, covered or treated with a dust suppressant.	monitoring programme will be carried out throughout the construction period.
		All vehicles carrying bulk materials into and out of the site will be sheeted so as to contain any material that may be dispersed during transit. Minimum drop heights will be used during material transfer	Daily visual inspections will be made to ensure that good practice is employed at all times. Inspections will include monitoring of exit points and the immediate area outside the site entrance.
		If finely ground materials are delivered, these will be in bag form or stockpiled in specified locations where the material can be suitably covered.	
		Engines will be switched off when not in use.	
		All vehicles will be properly maintained to reduce air emissions	
Protection of ground water	Moderate	Water inflows to excavated areas to be minimized by the use of lining materials, good house keeping techniques and by the control of drainage and construction materials in order to prevent the contamination of ground water. Site personnel to be made aware of the potential impact on ground and surface water associated with certain aspects of the construction works to further reduce the incidence of accidental impacts.	
Potential leakage of storage tanks	Moderate	Refueling of construction vehicles and equipment to be restricted to a designated area with properly designed fuel tanks and bunds and proper operating procedures.	Daily visual inspection of bunded areas will be made to ensure the effectiveness of these systems.
Protection of ground and surface water	Moderate	No materials will be disposed of in the local wadis.	
		Spill kits will be kept on site to clean up any spills of fuels or oils. Spills would be reported and responded to as quickly as possible.	
		Maintenance of construction machinery will not be allowed on	

		site unless absolutely necessary to help to prevent the accidental leakage of lubricating and hydraulic fluids.	
		Construction contractor to dispose of any construction effluents in a responsible manner.	
		Storage of construction materials will be in assigned areas and follow standard best working practices.	
		Disposal of excavated materials will either be off site at an appropriate landfill site or in areas of the site that will not give rise to surface run off during wet periods.	
		Portable toilets will be provided during the construction period with any waste tankered of site and disposed of in an appropriate manner.	
		Water inflows to excavated areas to be minimized by the use of lining materials, good house keeping techniques and by the control of drainage and construction materials in order to prevent the contamination of ground water.	
		Reuse excavated material within the site boundary where practicable which would reduce the volume of excavated material going off site to landfill.	
		Segregation of contaminated excavated material (should this be encountered), from non-contaminated excavated material would be made with the contaminated soils removed to an appropriate disposal site.	
Noise			
Construction noise	Moderate	All vehicles and mechanical plant used for construction would be fitted with effective exhaust silencers, and regularly maintained.	Daily auditory inspection/walk round to ensure best practicable means are being employed
		Inherently quiet plant would be used where appropriate	
		All major compressors would be sound-reduced models fitted with properly lined and sealed acoustic covers which would be kept closed whenever the machines are in use, and all ancillary pneumatic	

		percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers.	
		All ancillary plant such as generators, compressors and pumps would be positioned so as to cause minimum noise disturbance. If necessary, temporary acoustic barriers or enclosures would be provided.	
Ecology			
Aqueous effluent and runoff	Moderate	Potential aqueous effluent and runoff from site activities will be kept to an absolute minimum so as to ensure that there is no contamination of habitats and ecosystems outside the project boundary.	Visual inspection to ensure that construction impacts do not spread onto other land.
Removal of existing natural vegetation	Low	Unnecessary removal of existing natural vegetation will be avoided.	
Destruction of bird nests		Workers will be required not to cut down plants in the surrounding area for fires etc.	
		The destruction of bird nests will be prohibited. Any ground nests found inside the site will be moved in coordination with Ministry of Environment and the Royal Society for Conservation of Nature (RSCN) to an appropriate area.	
Disturbance to wildlife	Low	Construction activity will be kept to a minimum during nighttime to decrease disturbance on wildlife in the area.	
Planting of exotic or invasive plants	Low	The planting of exotic or invasive plants for landscaping inside and around the project site will be prohibited	
Hunting or killing of animals	Low	The contractor will not allow workers to hunt or kill animals. Any accidents resulting in the death of wild life will be reported to the Ministry of Environment and RSCN.	Any accidents resulting in the death of wild life will be reported to the Ministry of Environment and RSCN.
Visual Impact			
Visual impact of construction	Moderate	Construction equipment such as cranes etc that will be sized so as to serve their intended use without presenting an overly intrusive visual impact.	

		The contractor will be required to provide areas for the disposal of wastes during the construction period so as to prevent these escaping to the surrounding area and becoming unsightly.	Visual inspections will be made to ensure that plant wastes are not escaping to the surrounding environment.
		Land not required for permanent use by the power station will be reinstated to original or better condition.	
Traffic and Infrastructure			
Construction traffic	Moderate	Car sharing and the use of minibuses and public transport will be encouraged	
		The contractors appointed would be encouraged to provide a minibus service for construction staff	
		Car sharing and the use of minibuses and public transport will be encouraged by all staff	
Vehicle emissions		Regular servicing and maintenance of vehicles will be employed to help minimize emissions to air	
Dust and dirt generation	Moderate	Wheel washing may be employed to help prevent mud and earth being carried from the site on to local roads	Visual checks will be made to ensure that dust creation and mud carry are not encountered to any significant degree.
		In dry periods onsite roads may be dampened to reduce the potential for dust creation	
Road safety	Moderate	Adequate signage will be put in place as necessary.	The operator will check that all signage is in place as necessary.
		Drivers accessing the site will be obliged to comply with all Jordanian road safety laws	Where locals report cases of law breaking by staff with regard to speed limits etc this will be internally investigated as necessary.
Construction traffic management	Moderate	A Traffic Management plan will be prepared to help minimize the impact to the local traffic network.	
Archaeology			
Archaeological site finds	Moderate	Construction staff will report any finds that may have cultural or archaeological significance.	Construction staff will be requested to report any archaeological finds to an appropriate manager.
		If any site is found during	

		<p>construction and will be damaged by construction activities, the DOA will be invited to assess the discovered remains and may carry out an emergency salvage excavation salvage excavation which entails that archaeological excavation is conducted during construction phase. The contractor would be obliged to wait for a period of 10 days before commencing construction activities in the vicinity of an archaeological find to allow the DOA to respond to the sites identification.</p>	
		<p>The Contractor shall seek the written approval of the Department of Antiquities before the removal of any chance find building, foundation, structure, fence and other obstruction over 50 years old, any portion of which is in the quarrel.</p>	
		<p>The project should avoid the areas of archaeological interest identified in the environmental assessment. Fences should be placed around these areas to ensure no accidental damage to these areas occurs during the construction phase.</p>	
Socioeconomics			
Workers rights	N/A	<p>Labour law (No.51,2002) will be applied and complied with throughout the duration of the project as necessary.</p>	
On-site Health and Safety			
Safety	N/A	<p>Equipment, tools and substances will be suitable for their use and selected to minimize dangers to safety or health when used correctly.</p>	
		<p>Work places will where possible receive natural light and be supplemented with sufficient artificial illumination, and signage will appropriately mark hazards, exits, materials etc.</p>	
		<p>Sufficient fire prevention and protection will be adequate for the proposed use. Fire detection and protection systems will be provided as necessary.</p>	

		Places of work, traffic routes and passageways shall be kept free from waste and spillage, regularly cleaned, and maintained. First aid facilities will be provided and will be easily accessible throughout the place of work. Welfare facilities will include locker rooms, an adequate number of toilets with washbasins, and a room dedicated for eating. An ample supply of drinking water will be provided at all places of work.	
		Buildings and structures will be designed according to local and internationally recognized standards. They will be structurally safe, provide appropriate protection against the climate and have acceptable light and noise conditions.	
		Personal protection equipment will be identified and provided, that will offer adequate protection to the worker, co-workers and occasional visitors without incurring unnecessary inconvenience. The use of PPE will be actively enforced if alternative technologies, work plans or procedures cannot eliminate or sufficiently reduce a hazard or exposure. The employer shall ensure that PPE is cleaned when dirty, properly maintained and replaced when damaged or worn out. Proper use of PPE shall be part of the training programs for employees.	Daily visual inspection of use of PPE equipment would be made.
		Exposure to vibration from equipment will be controlled through selection of equipment and limitation of time of exposure. The limits for vibration and action values will conform to those provided by the IFC guidelines for OHS.	
		First aid facility adequately and appropriately stocked	A register of accidents on site would be maintained with prevention training sessions held.

		A health and safety plan would be prepared with the aim of preventing accidents and injuries for both and construction and operation stages of the project	Review site specific health and safety plan would be made on an appropriately regular basis.
		Sufficient training will be provided to all workers to ensure health and safety in the work place	A training register for Employees would be maintained and kept up to date with evaluation of training sessions made.
Community Health and Safety			
Community Health and Safety	N/A	The site will be located within a security fence ensuring to prevent trespass or accidental entry of the site by local peoples.	
		Construction materials will be managed safely with any stockpiles etc placed in areas to prevent any risk to local communities such as the materials becoming airborne through exposure to the wind.	
		Transport during all phases of the project will be managed so as to minimize impact to the local community.	Accidents and incidents involving the public will be documented and reported to management.
		The transport of raw materials and the transport and disposal of waste will be undertaken in an appropriate manner. Project vehicles and equipment will be well maintained with project-related traffic will be requested to travel no faster than the speed limit.	
		The contractor will allow for a means of complaints regarding on site activities to be made by members of the local community.	A complaints register will be maintained as necessary.

Construction Monitoring Program

Monitoring Issue	Monitoring Method	Monitoring Frequency
Air Quality		
Dust creation from soil movements, emissions from vehicles etc	Dust monitoring programme will be carried out	Upon receipt of complaint from local peoples/MoE etc
Inspections will include monitoring of exit points	Visual inspections	Daily during construction contract
Inspection of bunded areas	Visual inspections	Daily during construction contract
Construction noise	Auditory inspection/walk round to ensure best practicable means are being employed	Daily during construction contract
Aqueous effluent and	Visual inspection to ensure that construction	Daily during construction contract

runoff	impacts do not spread onto other land.	
Hunting or killing of animals	Any accidents resulting in the death of wild life will be reported to the Ministry of Environment and RSCN.	As necessary
Visual impact of construction	Visual inspections will be made to ensure that site wastes are not escaping to the surrounding environment.	Daily during construction contract
Visual impact of construction	Visual checks will be made to ensure that dust creation and mud carry are not encountered to any significant degree.	Daily during construction contract
Road safety	The operator will check that all signage is in place.	As necessary
	Where locals report cases of law breaking by staff with regard to speed limits etc this will be internally investigated.	As necessary
Archaeological site finds	Construction staff will be requested to report any archaeological finds to an appropriate manager.	As necessary
Safety	Visual inspection of use of PPE equipment would be made.	Daily
	A register of accidents on site would be maintained with prevention training sessions held.	As necessary
	Review site specific health and safety plan would be made on an appropriately regular basis.	Annually
	A training register for Employees would be maintained and kept up to date with evaluation of training sessions made.	As necessary
	Accidents and incidents involving the public will be documented and reported to management.	As necessary
	A complaints register will be maintained.	As necessary

Operational impact mitigation, monitoring, and management measures

Concern	Significance	Mitigation measure	Monitoring
Air quality			
None			
Water quality			
Potential leakage of storage tanks	Moderate	All oil and chemical storage tanks and areas where drums are stored will be surrounded by an impermeable bund. Single tanks will be within bunds sized to contain 110 percent of capacity and multiple tanks or drums will be within bunds sized to contain 110 percent of the capacity of the largest tank.	Inspection of bunded areas will be made to ensure the effectiveness of these systems during site visits by maintenance staff. All elements of the treatment systems will be regularly monitored to ensure optimum performance and maintenance.
Noise			
Operational noise	Moderate	Since tonal or impulsive noises are	Provisions to be put in

		considered more annoying than continuous noise sources, turbine items will be silenced or otherwise controlled through regular maintenance to ensure no such emissions are not significantly audible at NSR locations	place for the monitoring of noise at sensitive receptors (on and off site) in the event that there is a complaint or reason for concern.
Ecology			
Removal of existing natural vegetation	Low	The proponent will avoid any unnecessary removal of existing natural vegetation.	
Contamination by vehicle maintenance	Moderate	Any maintenance of vehicles or machinery will be performed off site unless strictly necessary.	
Hunting or killing of animals	Low	The proponent will not allow workers to hunt or kill animals.	Any accidents resulting in the death of wild life will be reported to the Ministry of Environment
Unauthorized/inappropriate parking	Low	Parking on areas outside the project area will not be allowed unless strictly necessary.	
Visual impact			
Screening	Moderate	Trees and bushes may be planted to provide screening for local receptors.	
Traffic and infrastructure			
Traffic management	Minor	Drivers will be instructed to obey all relevant speed limits and other relevant laws.	
Socioeconomics			
Workers rites	N/A	Labour law (No 51,2002) will be applied and complied with throughout the duration of the project as necessary.	
Safety			
Safety	N/A	Equipment, tools and substances will be suitable for their use and selected to minimize dangers to safety or health when used correctly.	
	N/A	Fire prevention and protection measurements will be included in the project design.	
		Personal protection equipment will be identified and provided, that will offer adequate protection to the worker, co-workers and occasional visitors without incurring unnecessary inconvenience. The use of PPE will be actively enforced if alternative technologies,	

		work plans or procedures cannot eliminate or sufficiently reduce a hazard or exposure. The employer shall ensure that PPE is cleaned when dirty, properly maintained and replaced when damaged or worn out. Proper use of PPE shall be part of the recurrent training programs for employees.	
		First aid facility adequately and appropriately stocked	
		A health and safety plan would be prepared with the aim of preventing accidents and injuries for the operation stages of the project.	
Community safety	N/A	Project vehicles and equipment will be well maintained with project-related traffic will be requested to travel no faster than the speed limit.	

Institutional Set Up

The responsibility for implementing the mitigation measures for the wind farm will be with selected project developer, while NEPCO will be responsible for the transmission line. NEPCO has experience in implementing EMPs for transmission lines and substations—its core line of business—and has staff employed for this purpose, including those responsible for assessment of compensation for land acquisition, property damage and reduced land use. They will work under NEPCO’s Project Manager responsible for the transmission line during preparation, construction, and decommissioning, and thereafter under the transmission department head. The wind farm developer will be responsible for implementation of the EMP through its contractors, consultants, and other specialists, during construction, operation, and decommissioning. The Plant Manager shall take over from the Project Manager during operation and shall delegate monitoring responsibilities to specific staff. The wind farm developer and NEPCO will coordinate with other entities within Jordan, including MoE, WAJ, Fajr, and RSCN.

Resettlement

The project will not involve resettlement. However, OP4.12 is triggered due to the likelihood of compensation for land used for the transmission line towers and for reduced land use to ensure safety. Because of this, the RPF has been prepared and disclosed in-country and in the InfoShop/Public Information Centers.

Description of Safeguards

The number and type of safeguards triggered by the proposed project will depend on the exact location of the wind farms. The initial assessment shows that the following safeguards will be triggered. The environmental category is expected to be B.

Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)		X
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Cultural Property (OPN 11.03)		X
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)		X
Projects on International Waterways (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X

Annex 11: Project Preparation and Supervision
JORDAN: PROMOTION OF A WIND POWER MARKET

	Planned	Actual
PCN review	03/07/2006	
Initial PID to PIC	03/09/2006	
Initial ISDS to PIC	03/09/2006	
GEF Council Approval	04/01/2006	
Appraisal	12/10/2007	
Negotiations	04/15/2008	
GEF CEO Endorsement	05/07/2008	
Board Approval	06/26/2008	
Planned date of effectiveness	08/26/2008	
Planned date of mid-term review	12/31/2009	
Planned closing date	06/30/2011	

Key institution responsible for preparation of the project:

Ministry of Energy and Mineral Resources
Ministry of Planning and International Cooperation
National Electric Power Company
Electricity Regulatory Commission

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Reynold Duncan	Lead Energy Specialist, Team Leader	AFTEG
Noureddine Bouzaher	Sr. Energy Economist	MNSSD
Rome Chavapricha	Infrastructure Specialist	MNSSD
Angeline Mani	Program Assistant	MNSSD
Hayat Taleb Al-Harazi	Program Assistant	MNSSD
Dahlia Lotayef	Senior Environmental Engineer	MNSSD

Kanta Kumari Rigaud	(Reviewer) Senior Environmental Specialist	MNSSD
Colin Scott	(Reviewer) Lead Social Development Specialist (Reviewer)	MNSSD
Kenneth Mwenda	Senior Counsel	LEGMS
Josephine Masanque	Senior Financial Management Specialist	MNAFM
Mona El-Chami	Financial Management Specialist	MNAFM
Meskerem Brhane	Social Development Specialist	MNSSD
Mario Antonio Ze laya	Environmental Specialist (Consultant)	MNSSD
Jan Hamrin	STAP Reviewer	
Ahmed Merzouk	Senior Procurement Specialist	MNAPR

Estimated Approval and Supervision costs:

1. Remaining costs to approval: \$200,000
2. Estimated annual supervision cost: \$120,000

Annex 12: Documents in the Project File

JORDAN: PROMOTION OF A WIND POWER MARKET

References:

Barriers Removal through Resource Assessment and Regulation of Renewable Energy ; Lahmeyer International; June 2006

Electrification of Small and Rural Villages in Jordan, Complete Environmental and Gender Equity Report; RSW Inc.; June 2004

NEPCO, CEGCO, JEPCO, EDCO, IDECO Annual Reports; 2006

Electricity Regulatory Commission Annual Report; 2006

Ministry of Energy and Mineral Resources Annual Report; 2006

Central Bank of Jordan Annual Report; 2006

Review of Rural Fils Fund Project; Privatization Consortium; June 20, 2002

Feasibility Study on Commercial Wind Farms (Jordan); COWI; July 2007

Fujeij Wind Farm Environmental Assessment; PB Power; November 2007

Fujeij Wind Farm Resettlement Policy Framework; PB Power; November 2007

Development of Institutional and Operating Arrangements for the Jordan Renewable Energy and Energy Efficiency Fund (JREEF) Final Report; November 2007

National Energy Strategy; Final Draft December 2007

Annex 13: Statement of Loans and Credits

JORDAN: PROMOTION OF A WIND POWER MARKET

Status of Bank Group Operations as of March 22, 2006 (Update)

Active Projects		Amount in US\$ Millions			Difference Between Expected and Actual Disbursements^{a/}	
Project ID	Project Name	IBRD	GRANT	Undisb.	Orig.	Frm Rev'd
P049706	ODS Phaseout II		5.0	0.9	0.4	0.1
P048521	Amman Water & Sanitation	55.0		2.2	2.2	1.0
P069326	Higher Education Development	34.7		11.7	11.7	2.1
P076961	Horticultural Exports Promotion	5.0		3.0	3.0	0.0
P075829	Education Reform for Knowledge Ec.	120.0		83.5	29.1	0.0
P069847	Conservation of Medicinal Plants		5.0	3.9	1.7	
P081505	Amman Development Corridor	38.0		35.9	13.8	0.0
P091787	Public Sector Reform Capacity Building	15.0		14.4	4.0	
Total		267.7	10.0	155.5	65.9	3.2

Jordan
Committed and Disbursed Outstanding Investment Portfolio
As of 11/30/2007
(In USD Millions)

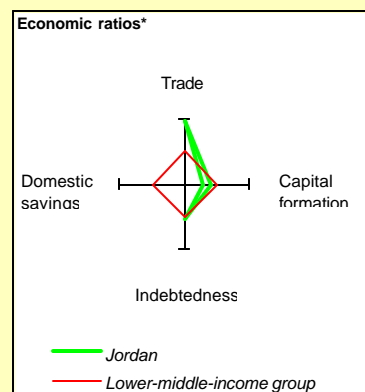
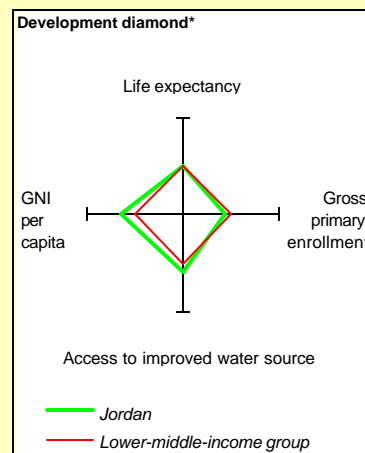
FY Approval	Company	Committed					Disbursed Outstanding				
		Loan	Equity	**Quasi Equity	*GT/RM	Participant	Loan	Equity	**Quasi Equity	*GT/RM	Participant
08/08/2008/08	Ado jordan	280	0	200	9.9	640	37.44	0	21.39	7.37	85.59
08/08/2008	Aiq p.s.c	0	0	0	15.68	0	0	0	0	7.16	0
03/03/2003/03	Al-hikma	27.51	0	0	0	0	27.51	0	0	0	0
01/01/2001/01	Boscan jordan	6	0	0	0	0	6	0	0	0	0
1997/97/97/97	Btc	3.12	0	0	0	0	3.12	0	0	0	0
08/08/2008/08	Capital bank ior	0	120	40	0	0	0	59.98	0	0	0
06/06/2006/06	Cti	52.89	0	0	0	0	52.89	0	0	0	0
0/00/00/00	Hikma uk	0	3.4	0	0	0	0	3.4	0	0	0
1999/99/99/99	Maico	0	1	0	0	0	0	0	0	0	0
02/02/2002/02	Meren	3.42	2.4	0	0	0	3.42	2.4	0	0	0
2000/00/00/00/08/08	Sqbj	0	10.16	0	0	0	0	6.04	0	0	0
1996/96/96/96/08	Zara	40	11.88	0	0	0	0	11.88	0	0	0
Total Portfolio:		412.94	148.84	240	25.58	640	130.38	83.7	21.39	14.53	85.59

* Denotes Guarantee and Risk Management Products.

** Quasi Equity includes both loan and equity types.

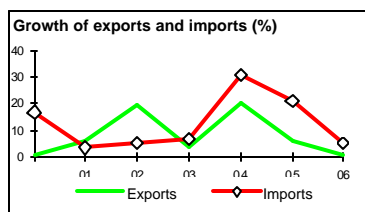
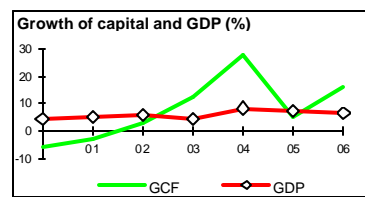
Annex 14: Country at Glance
JORDAN: PROMOTION OF A WIND POWER MARKET

	Jordan	M. East & North Africa	Lower-middle-income		
POVERTY and SOCIAL					
2006					
Population, mid-year (millions)	5.6	311	2.276		
GNI per capita (Atlas method, US\$)	2,630	2,481	2,037		
GNI (Atlas method, US\$ billions)	14.7	771	4.635		
Average annual growth, 2000-06					
Population (%)	2.5	1.8	0.9		
Labor force (%)	3.6	3.5	1.4		
Most recent estimate (latest year available, 2000-06)					
Poverty (% of population below national poverty line)	14		
Urban population (% of total population)	83	57	47		
Life expectancy at birth (years)	72	70	71		
Infant mortality (per 1,000 live births)	22	43	31		
Child malnutrition (% of children under 5)	4	15	13		
Access to an improved water source (% of population)	97	90	81		
Literacy (% of population age 15+)	91	73	89		
Gross primary enrollment (% of school-age population)	96	103	113		
Male	95	106	117		
Female	96	99	114		
KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1986	1996	2005	2006	
GDP (US\$ billions)	6.2	6.9	12.7	14.2	
Gross capital formation/GDP	20.5	29.4	23.7	26.0	
Exports of goods and services/GDP	29.3	52.9	51.9	50.7	
Gross domestic savings/GDP	-5.6	4.1	-17.9	-18.0	
Gross national savings/GDP	18.1	26.2	6.7	4.8	
Current account balance/GDP	-0.7	-3.2	-17.0	-23.0	
Interest payments/GDP	3.5	4.9	1.3	..	
Total debt/GDP	78.2	106.6	60.5	..	
Total debt service/exports	19.2	18.2	6.5	..	
Present value of debt/GDP	59.3	..	
Present value of debt/exports	79.1	..	
	1986-96	1996-06	2005	2006	2006-10
<i>(average annual growth)</i>					
GDP	2.8	5.1	7.2	6.4	5.1
GDP per capita	-2.1	2.6	4.8	3.1	2.7
Exports of goods and services	5.8	5.7	5.8	0.7	11.2



STRUCTURE of the ECONOMY

	1986	1996	2005	2006
<i>(% of GDP)</i>				
Agriculture	6.3	3.8	2.8	2.7
Industry	24.4	26.1	29.6	31.7
Manufacturing	10.6	13.8	19.2	20.7
Services	69.3	70.0	67.6	65.6
Household final consumption expenditure	79.4	78.6	102.6	102.2
General gov't final consumption expenditure	26.2	17.3	15.3	15.7
Imports of goods and services	55.4	78.2	93.4	94.7
	1986-96	1996-06	2005	2006
<i>(average annual growth)</i>				
Agriculture	5.1	4.1	5.7	5.4
Industry	4.0	7.7	9.5	11.4
Manufacturing	5.4	10.2	11.2	12.0
Services	1.5	4.2	6.2	-2.5
Household final consumption expenditure	1.9	7.8	22.7	5.5
General gov't final consumption expenditure	-4.2	3.9	1.0	8.2
Gross capital formation	5.6	4.2	5.0	16.2
Imports of goods and services	2.6	7.9	21.2	4.9



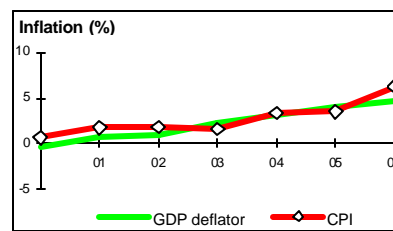
Note: 2006 data are preliminary estimates.

This table was produced from the Development Economics LDB database.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

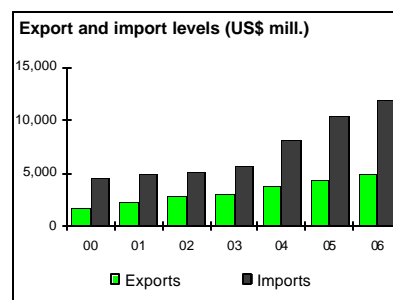
PRICES and GOVERNMENT FINANCE

	1986	1996	2005	2006
Domestic prices				
<i>(% change)</i>				
Consumer prices	0.0	6.5	3.5	6.3
Implicit GDP deflator	0.1	2.1	4.0	4.8
Government finance				
<i>(% of GDP, includes current grants)</i>				
Current revenue	37.1	37.3	33.5	33.9
Current budget balance	10.7	9.7	1.9	4.1
Overall surplus/deficit	-1.0	2.3	-4.6	-3.4



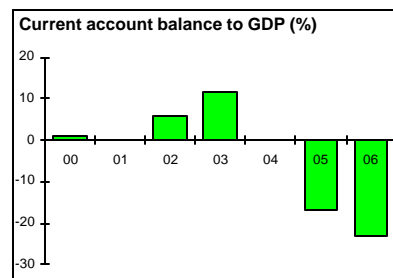
TRADE

	1986	1996	2005	2006
<i>(US\$ millions)</i>				
Total exports (fob)	731	1,878	4,289	4,911
Food and live animals	120	228	490	502
Phosphates	185	181	168	158
Manufactures	237	750	1,627	1,802
Total imports (cif)	2,429	4,340	10,466	11,941
Food	473	979	1,971	2,185
Fuel and energy	317	531	2,328	2,871
Capital goods	404	1,127	2,192	2,509
Export price index (2000=100)	83	117	131	144
Import price index (2000=100)	83	103	156	169
Terms of trade (2000=100)	100	113	84	85



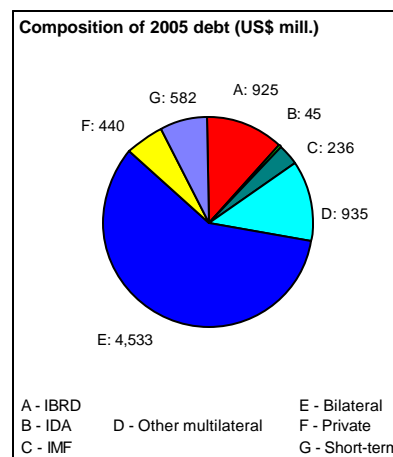
BALANCE of PAYMENTS

	1986	1996	2005	2006
<i>(US\$ millions)</i>				
Exports of goods and services	1,803	3,706	6,591	7,186
Imports of goods and services	3,316	5,479	11,873	13,421
Resource balance	-1,513	-1,773	-5,281	-6,235
Net income	-150	-304	376	273
Net current transfers	1,617	1,853	2,747	2,708
Current account balance	-46	-225	-2,158	-3,254
Financing items (net)	74	13	2,319	4,009
Changes in net reserves	-28	212	-160	-755
Memo:				
Reserves including gold (US\$ millions)	641	1,957	5,517	6,192
Conversion rate (DEC. local/US\$)	0.3	0.7	0.7	0.7



EXTERNAL DEBT and RESOURCE FLOWS

	1986	1996	2005	2006
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	4,832	7,385	7,696	..
IBRD	281	777	925	897
IDA	81	67	45	42
Total debt service	594	978	616	..
IBRD	36	127	106	123
IDA	1	3	3	3
Composition of net resource flows				
Official grants	455	167	541	..
Official creditors	189	405	-52	..
Private creditors	434	-159	145	..
Foreign direct investment (net inflows)	23	16	1,532	..
Portfolio equity (net inflows)	0	0	60	..
World Bank program				
Commitments	78	180	15	0
Disbursements	83	169	48	43
Principal repayments	16	80	76	80
Net flows	67	89	-28	-38
Interest payments	22	49	33	46
Net transfers	45	40	-61	-83



Annex 15: Incremental Cost Analysis

JORDAN: PROMOTION OF A WIND POWER MARKET

Incremental Cost Analysis

Global Environmental Objective

This analysis of the incremental cost of adding 65 MW of wind-based power to the Jordanian interconnected system highlights the potential for GHG reduction and fuel savings. The project would involve implementation, by the private sector, of a 60-70 MW promotional wind farm at an estimated economic cost of US\$118 million. GEF support will finance the various barrier removal activities for the development of the wind power market and be used as performance-based subsidy/grant to finance the incremental cost of the promotional wind farm.

Broad Development Goals and Baseline

The Hashemite Kingdom of Jordan has little indigenous energy resources, raising the issue of security and reliability of supply. The provision of reliable energy supply at reasonable cost has been recognized by the government as one of the crucial elements required to transform the highly indebted, mostly state-controlled, economy into an export-oriented economy with the private sector playing a leading role.

Within the MENA region, Jordan was one of the first to initiate fundamental reforms in the electricity sub-sector and much progress has been made in this respect. An energy sector strategy prepared in the 1990s provided the basis for the GoJ's initiatives in the sector under its Second Economic Reconstruction Development Program supported by the Bank. More recently, the December 2007 update of the National Energy Strategy calls for an increase dependence on local energy sources, with a particular emphasis on utilizing the locally available oil shale, renewable energy and alternative sources. For wind energy, the strategy calls for expedited implementation of the 30-40 MW wind farm at Al-Kamsha, the 60-70 MW wind IPP at Fujeij (the proposed project), and an additional 100-200 MW at Al-Harir.

GHG Emissions

The estimated current emissions of CO₂ from electricity and heating in Jordan amount to about 6.5 million metric tons (MT)¹⁹ (equivalent to 1.8 million MT per year of carbon), and contribute about 36% of the total CO₂ emissions. Future contribution is expected to reduce as the remaining HFO-fueled power plants are converted to use natural gas, new CCGT plants are fueled by natural gas, and GoJ's plan to increase the proportion of renewable energy for electricity supply.

Impact of 65 MW of Wind Power Capacity on Power Generation in Jordan

Methodology

¹⁹ Base on 1999 figure of 5 metric tons

The analysis was based on comparison of the proposed wind farm with a comparable CCGT power project that produces the same amount of energy, without considering system-wide effects²⁰. This is justifiable on the basis that the proposed additional capacity of 65 MW is very small relative to the system size of 2,076 MW (2006). It can therefore be absorbed without major repercussions to the power system's performance. The comparison allows the analysis of the entire life of the plant. Furthermore, the wind power alternative is assumed to provide energy that would offset supply from the thermal baseline, but with negligible contribution to capacity due to the intermittent availability of wind. The key assumptions are shown in Table 2.

Although the exact site(s) of the wind farm(s) has/have not been decided yet, they are expected to be at one or two of three sites in the south-western part of the country near Aqaba where the wind speeds exceed 6.5 m/s and capacity factors close to 35% would be achievable.

²⁰ The analysis did not model the wind farm as part of the integrated generation model.

Table 2: Key Assumptions

Parameter	Value
Technical	
Plant lifetime (years)	20
Capacity, wind (MW)	65 (nameplate), 63.1 (rated)
Capacity CCGT plant (MW)	65
Capacity factor, wind (%)	35
Capacity factor, CCGT (%)	35
Heat rate (BTU/kWh)	7,500
Economic	
Capital cost, CCGT (US\$/kW rated)	1,250
Capital cost, wind (US\$/kW rated)	1,813
Growth in fuel costs (% p.a.)	0
Variable O&M costs, wind (USc/ kWh)	1.25
Fixed O&M cost, wind (US\$/kW)	23.3
Fixed O&M cost, CCGT (US\$/ kW)	20.0
Variable O&M costs, CCGT (USc/ kWh)	0.22
Discount rate (%)	10

Costs

Economic Capital costs

The wind farm entails substantially higher capital costs than conventional technology – currently above US\$1,000 per kW due to high demand for the equipment. A rate of US\$1,813 per kW was used in the analysis. This compares with about US\$1,250 per kW of the baseline CCGT plant. The estimated economic capital cost of the 65 MW wind farm would be US\$118 million and for the baseline CCGT plant would be US\$81 million.

Recurrent costs

The main recurrent cost elements are with respect to fuel purchases and operation and maintenance (O&M). Over the years, operators have succeeded in substantially reducing O&M costs by increasing the efficiency and lifetime of wind turbine components, improving the effectiveness of the wind farm and other measures. As a result, typical O&M costs for a wind farm have come down to about 1.25 US cents/ kWh. This compares with about 0.22 US cents/ kWh for a CCGT plant. The higher O&M costs for the wind farm are partially offset by savings in fuel costs. For the baseline power plant, the analysis is based on a natural gas cost of US\$4.0/MMBTU in accordance with the National Energy Strategy (updated December 2007).

Incremental costs

The above considerations result in a net present value incremental costs of US\$6.3 million, discounted at 10% opportunity cost of capital as shown in Table 3.

Table 3: Detailed Incremental Costs

Calculation of Incremental Cost		US\$ Million		
	Discount rate	8%	10%	12%
Reference Baseline CCGT				
Capital costs		69.7	67.3	64.9
Fuel costs		46.7	38.4	31.9
Fixed O&M costs		10.1	8.3	6.9
Variable O&M costs		3.4	2.8	2.3
Total		130.0	116.7	106.1
	PV GWh	1557.7	1278.4	1062.6
Levelized electricity costs (cents/kWh)		8.35	9.13	9.98
Wind				
Capital costs		101.1	97.5	94.2
Fuel costs		0.0	0.0	0.0
Fixed O&M costs		11.7	9.6	7.9
Variable O&M costs		19.5	16.0	13.3
Total		132.2	123.1	115.4
	PV GWh	1557.7	1278.4	1062.6
Levelized electricity costs (cents/kWh)		8.49	9.63	10.86
Increment:				
Capital costs		31.4	30.3	29.2
Fuel costs		(46.7)	(38.4)	(31.9)
Fixed O&M costs		1.5	1.2	1.0
Variable O&M costs		16.0	13.2	10.9
Total incremental cost		2.2	6.3	9.3
Incremental levelized costs (cents/kWh)		0.14	0.50	0.88

Incremental Cost Matrix

Table 4, the Incremental Cost Matrix, shows the comparison of the baseline CCGT power plant and the proposed 65 MW wind farm alternative. The incremental costs would be funded partially by the GEF grant and possibly other donors through a performance-based subsidy of a limited duration or one-off, as well as through the adjustment of the bulk supply tariffs (See Annex 4 for details). Other incentive options are under consideration, including: (i) waiving of stamp duty and university fee, (ii) tax break, (iii) connection to the grid financed by the transmission company (NEPCO), and (iv) land lease at no cost to the developer.

Table 4: Incremental Cost Matrix

	Baseline	Alternative	Increment
Domestic Benefit	Produce 200 GWh of annual electricity output from a comparable CCGT power plant.	Produce 200 GWh of annual electricity output from a 65 MW wind farm. It is assumed that US\$2.8 million of GEF grant will be earmarked towards paying part of the incremental cost.	Improved utilization and increased value of wind power generation. Expansion of the wind power market.
Global Environmental Benefits	1, 817,719 MtC over 20 yrs (90,886 tC per year)	0 MtC over 20 yrs	1, 817,719 MtC over 20 yrs (90,886 tC per year)
Discounted Costs by Component (US\$m):			
Capital	67.27	97.54	30.27
Fuel	38.35	0.00	-38.35
O&M	11.13	25.54	14.41
Technical Assistance		2.4	2.4
Market Development		1.6	1.6
Total	116.75	127.08	10.33
GoJ Contribution, Renewable Energy Fund, Tariff Increase			4.33
GEF Incremental Costs (US\$m)			6.00

Process of Agreement

Lahmeyer International has performed an initial “with/ without wind” analysis of the impact of wind for the determination of incremental costs. The analysis is based on comparison of the proposed wind power plant with the least-cost conventional solution in the same capacity range, excluding system-wide effects, which are considered insignificant because of the size of the addition relative to the power system. The results were reviewed and agreed with MEMR.

Annex 16

a) STAP Roster Review

JORDAN: PROMOTION OF A WIND POWER MARKET

INDEPENDENT TECHNICAL REVIEW

Submitted by Jan Hamrin, PhD
March 11, 2006

1. Introduction

The purpose of this project is to help kick start a sustainable wind power market in Jordan by using 60 MW of IPP Wind Power as the catalyst for change in the financial, legal and regulatory sectors necessary to achieve the Government of Jordan's long-term renewable resource goals. The Government of Jordan has been working to lift prices of domestic fuels and diversity the fuel mix in order to reduce dependence on imports and use of oil with their related balance of payment and negative environmental impacts. In addition, there have been a number of activities supported by bilateral and multilateral organizations that are aimed at the achievement of the current 5 percent target. Through all of these activities the government has demonstrated a strong commitment to promoting renewable resources. This project builds on these other activities to help the government achieve their target in a sustainable manner.

2. GEF Context

This project fits into the GEF Operational Program 6: Promoting the adoption of renewable energy by removing barriers and reducing implementation costs, as well as indirectly addressing the GEF strategic priority CC2: Increased access to local sources of financing for renewable energy and energy efficiency. "The wind projects may be partly funded by local sources as well as by foreign private capital." (P.6.) This reviewer agrees with the project proponents that the successful execution of the project would generate confidence among local financial institutions regarding renewable energy projects and the capacity building activity for financial intermediaries and other stakeholders would definitely enhance awareness and the ability to analyze and finance renewable energy proposals in the future. If successful, all of this should lead to increased involvement of the local financial sector in renewable energy development. And finally, the GEF financial incentive to the project is sufficiently small that as the costs of competing new generation rise and the costs of renewable generation continue to decline, future renewable projects in Jordan should be able to be absorbed into the tariff structure without continued outside subsidies.

3. Key Issues

3.1 Project Approach

The reviewer agrees with the project approach of using the development of actual projects as the basis for capacity building and raising awareness in the financial, legal and regulatory sectors. Working through the development of model power purchase agreements, modeling the actual value of wind generation to grid operations, organizing and running an auction process are all excellent learning activities for the people involved.

The project is well designed and focused on common barriers to renewable development related to: gaps in legal and regulatory frameworks, lack of institutional capacity and information on wind resources, and inexperience in the financial sector in evaluating risks associated with wind energy development. The provision of supplemental modeling tools to better assess the value of wind power in integrated power system operations is an excellent addition to the capacity building and awareness piece of this project. In addition to the Technical Assistance and Wind Power Development sections, there is contingent funding to promote market development for renewable energy beyond the proposed project. This is wise in that a number of other issues may emerge requiring additional funds such as transmission line expansion, and resource mapping so having contingent funds is an excellent strategy to ensure the wind power market continues to move forward. Finally, the project support is production-based (one cent per kWh) thereby encouraging the efficient construction and operation of the projects.

3.2 Scientific & Technical Soundness

The project seems to be scientifically and technically sound. The one area of question is with the wind resource data. As described in Section D, page 12, and Annex 15, page 44 -- Fujeij and Wadi Araba project sites have "...sustained wind speeds in excess of 7m/s at 10 m height," and on page 44, "wind speeds exceed 6.5 m/s and a capacity factor of about 40 % would be achieved." Depending upon the circumstances, his wind resource may not produce a 39 or 40 percent net capacity factor mentioned in the Project Description under Component 2 on page 9, and in the Financial Analysis Assumptions in Annex 8, page 33 and Annex 15, Page 44 and 45 and the proponents might want to use a slightly more conservative estimate. Certainly the wind developers interested in building these facilities will indicate what level of power they believe the projects will produce when they submit their bids. Moreover, additional wind resource data will be collected between now and the time of bidding with the best sites selected for project development thereby resolving this question during the early phase of the project. However, the project is premised on the financial viability of a wind farm that incorporates a one cent/kWh subsidy combined with a sufficient electricity tariff to reduce the difference between the Baseline (natural gas-thermal) and the proposed Alternative (wind power) to a manageable level that can be easily absorbed in rates. "The sensitivity analysis showed that the project is highly sensitive to" investment costs; discount rate; and the level of the electricity tariff," (page 32 Annex 9, Economic and Financial Analysis). However, experience has shown that accurate wind resource measurement may be as significant a variable for the success of a wind project as any of these other elements.

3.3 Adequacy of the Financing Mechanism

Using competitive bidding as the basis for awarding 60 MW of wind power projects should contribute to the economic efficiency of obtaining these resources at a reasonable cost. However, competitive bidding at the beginning of renewable development is not conducive to building a renewable energy industry within the country (if Jordan has this as one of their long-term goals). This competitive bid will tend to attract international companies that already have experience with building wind farms in other regions of the world. The winning bidders, if the criteria are heavily weighted toward price, are also likely to be vertically integrated companies that manufacture their own turbines. Jordan may have too small of a domestic electricity load to justify local manufacturing, but it is an issue to keep in mind as the country moves into later phases of renewable energy policy development.

If the preliminary assumptions hold up through the bidding process, the financing mechanism, adding a one cent/kWh subsidy, and a cost reflective tariff, should result in project price that can be feasibly incorporated into the general electricity tariff for the country.

3.4 Identification of Global Environmental Benefits

As accurately portrayed in the Project Appraisal Document, if successful, this project should result in reduction of greenhouse gases associated with the production of electricity in Jordan. Renewable energy (along with energy efficiency) is becoming a particularly valuable tool for reducing electricity sector greenhouse gas emissions while supporting the expansion of electricity services in developing countries. This project is consistent with and supportive of Jordan's national development priorities as well internationally agreed programs of action for sustainable development.

3.5 Fit with GEF Work

The project conforms to the strategic priorities of GEF – SP2: Increased financing availability, and SP3: Power sector regulatory frameworks and policies for grid-based renewable energy. In this reviewer's opinion, this project is an excellent fit with GEF work.

3.6 Regional Context

At the national level the proposed project should directly contribute to meeting the Government of Jordan's goal of 5 percent renewables in the energy mix by 2015. In addition the project should result in such social and economic benefits to the country as capacity building and employment generation. The Government of Jordan would like to create an environment conducive to private investment (page 5), to reduce their deficit and address priority issues of poverty reduction and job creation. This project is directly supportive of that goal.

3.7 Replicability

This is the type of project that is definitely replicable in other countries with similar wind or other renewable resources. It is similar to projects in Mexico and as well as other emerging nations and developing countries. Bringing grid-connected renewables into developing countries is more a matter of

education and capacity building than it is a technical challenge. This project is focused on all of the right issues that are common throughout the world where good wind resources exist but the key stakeholders have not yet had direct experience with the technology in their own grid.

3.8 Sustainability

From a wind power project perspective, using a production-based financial incentive should result in a project(s) built to perform efficiently over time. From the perspective of developing a sustainable renewable energy market in Jordan, this project should provide a good framework upon which a long-term program can be built.

4. Minor Comments

4.1 Linkages to other Focal Areas

No comments on this topic.

4.2 Linkages to Other Programs

This program seems to be closely related to projects in Mexico and to some extent China

4.3 Degree of Involvement of Stakeholders

A key factor in meeting the capacity building activities of this project is stakeholder participation. Though the proposal indicates that stakeholder participation is a key element of this project, this author would like to reinforce its importance and the difficulty of delivering on this element. Stakeholder management is not a simple task. It needs to be built into the process from the beginning of the project. It will always be easier for a small group of two or three people to make decisions and then announce them to the rest than to involve a broad group of stakeholders. However, to achieve the capacity building goals, stakeholders have to be directly involved in decision making and go through the time consuming and sometimes painful process of discovering answers for themselves. Stakeholder participation is easy to say and hard to do. This reviewer encourages the project managers to recognize this from the start and not be discouraged when they find stakeholder participation is contrary to efficient decision making.

4.4 Capacity Building Aspects

Capacity building is a central theme of this project and has been well thought out and identified in the Project Appraisal Document. There are a great number of capacity building opportunities related to the tasks to be accomplished and if successful, this project should make a significant contribution to the regulatory, financial and legal capacity in Jordan to assess and incorporate renewables into its electricity sector. (Also see “Degree of Involvement of Stakeholders” discussion above.)

4.5 Innovativeness

No comments.

5. Conclusions

The project is technically feasible and the approach is sound. If all the elements of the Wind Power Market Promotion project are successfully undertaken, and the financial assessment holds up through the bidding process, this project should be capable of meeting its goals and making a positive contribution to the process of renewable energy development in Jordan. I recommend the project for approval.

6. Substantive Editorial Comments

6.1 Other Financial Analysis Assumptions

The financial assumptions for both the wind baseline project (“...the conventional least cost solution in the same capacity range and producing the same amount of energy” – i.e. a combined cycle gas turbine -- Annex 15, pages 42 through 48), should be re-evaluated based on recent data at the time of bid evaluation. For example, wind equipment costs have increased by almost 20 percent over the past year due to increased global demand. Though this information will also be revealed through the bidding process, what will not be revealed is the cost of the ‘competing’ baseline resource. At the same time that wind has increased by 20 percent, CCGT costs have increased by 100 percent. The volatility of fossil fuel prices is a major driver for renewable energy development in regions dependent upon gas and oil fueled power.²¹ It is important that not only the wind data but the cost data for the baseline plant be revised so the comparisons are based on the latest information at the time of project appraisal and decision makers are able to accurately compare the costs and benefits of renewables with those of the alternative.

The CCGT Average Electricity price numbers used in the incremental cost evaluation (Annex 15, page 46) look like they may be based on \$3 to \$4/million natural gas prices not likely to be seen again in the gas market in the near future. Moreover, the 35.3 percent efficiency of the gas turbine (Annex 15, page 45) may not be realistic for a 60 MW CCGT. Larger facilities operate at this level but smaller ones are often less efficient. This reassessment may well result in a more favorable financial scenario for the wind facilities than shown in the project appraisal document (even with a slightly downward adjustment in the capacity factor for the wind project).

6.2 Transmission Issues

²¹ In the western United States, wind generation at cost similar to those included in this proposal is the least cost alternative today.

The project should anticipate some issues associated with expansion of the transmission system to accept the wind energy. Annex 10, page 37 notes "...compensation issues are likely to arise along the routes of the transmission line(s) connecting the power plant(s) to the national grid." However nothing is said about perceived technical issues. The project managers should anticipate that transmission cost and integration issues are likely to develop over the course of this project, given experience to date with wind development in other countries. There should not be any insurmountable technical issues associated with integrating this level of wind generation into the grid, however many transmission operators are wary of adding intermittent wind capacity because they have had no experience with it and fear it will disrupt system operations. A significant amount of education and hand holding may be required before the system operator feels comfortable with interconnecting these projects. However, the budget forecast for this project should be adequate to deal with these questions.

Response to STAP Review

Issue	Response
<p>Scientific and Technical Soundness The wind resource may not produce a 39 or 40 percent net capacity factor mentioned in the Project Description.</p>	<p>The wind speeds in the proposed project area (between the Gulf of Aqaba and the Dead Sea) are in the order of 8 m/s, with wind power densities above 220W/m² and harvestable energy above 2W/m². Measurements at Fujei were taken at 50m. This notwithstanding, further wind resource measurements are being carried out, both in the originally selected areas as well as other parts of the country, and at the appropriate height. This information will be available at the time of bidding.</p>
<p>Adequacy of Financing Mechanism Competitive bidding at the beginning of renewable development is not conducive to building a renewable energy industry within the country (if Jordan has this as one of their long-term goals). This competitive bid will tend to attract international companies that already have experience with building wind farms in other regions of the world. ...Jordan may have too small of a domestic electricity load to justify local manufacturing.</p>	<p>The team agrees that the Jordanian electricity market is currently too small to justify local manufacturing. With potential for wind power in neighboring countries such as Lebanon and Egypt and demand growth in Jordan, local manufacturing for the regional market could be justified in the future.</p>
<p>Other Financial Analysis Assumptions It is important that not only the wind data but the cost data for the baseline plant be revised so the comparisons are based on the latest information at the time of project appraisal and decision makers are able to accurately compare the costs and benefits of renewables with those of the alternative.</p>	<p>Both will be updated. For the wind alternative, the bid price will be used. (Annex 15).</p>
<p>Other Financial Analysis Assumptions The CCGT Average Electricity price numbers used in the incremental cost evaluation (Annex 15, page 46) look like they may be based on \$3 to \$4/million natural gas prices not likely to be seen again in the gas market in the near future. Moreover, the 35.3 percent efficiency of the gas turbine (Annex 15, page 45) may not be</p>	<p>The gas price is indeed \$3.4 per mMBTU (information provided after review – see Annex 15). This is higher than the current price of US\$2.9 but the team agrees it could still be below the economic value (Annex 15). It will be reviewed at appraisal.</p> <p>It should be noted that a much larger capacity</p>

Issue	Response
<p>realistic for a 60 MW CCGT. Larger facilities operate at this level but smaller ones are often less efficient. This reassessment may well result in a more favorable financial scenario for the wind facilities than shown in the project appraisal document (even with a slightly downward adjustment in the capacity factor for the wind project).</p>	<p>than 60 MW would normally be installed, and it would have the characteristics used in the analysis. It is therefore reasonable to scale down only the capital and operational costs; not the efficiency.</p>
<p>Transmission Issues There should not be any insurmountable technical issues associated with integrating this level of wind generation into the grid, however many transmission operators are wary of adding intermittent wind capacity because they have had no experience with it and fear it will disrupt system operations. A significant amount of education and hand holding may be required before the system operator feels comfortable with interconnecting these projects.</p>	<p>The team agrees. The issue of integration of wind energy in grid supply is being tackled in two phases. First, agreement is being sought from the Single Buyer, NEPCO, the Electricity Regulatory Commission and the Ministry of Energy and Mineral Resources on a wind energy premium in the tariff. This is expected prior to appraisal. During the project, the TA component will assist NEPCO with the necessary tools and training for the inclusion of wind energy in its power generation planning. This will enable NEPCO to assess the value of wind-based power supply, and thereby provide the basis for a suitable tariff/ premium.</p>
<p>Stakeholder Participation Stakeholder participation is easy to say and hard to do. This reviewer encourages the project managers to recognize this from the start and not be discouraged when they find stakeholder participation is contrary to efficient decision making.</p>	<p>The team agrees and will pay particular attention to this aspect. The TA component provides for this.</p>

b) Response to Comments from GEF Council Members

42. Jordan: Promotion of a wind power market

Comments

The project is relevant for Jordan, taking into account its high dependence on imported fuels (oil and gas) and related security of supply issues, and the availability of proven good wind resources. The Government of Jordan has already initiated significant reforms in the power sector through unbundling of production, transport and distribution. Private generation is now possible through IPP, the transport remaining the exclusivity of the national NEPCO utility.

The power sector is rather efficient with modern power plants and a near complete electrification of urban and rural areas. Efforts are being carried out to reduce power costs through efficient management and rational tariffs to facilitate economic development despite a difficult international environment. The power utilities are consequently cautious on the wind energy option fearing that it might increase generation costs and destabilize the interconnected grid.

The project document highlights well the main barriers to the dissemination of wind parks in Jordan and the proposed activities are focused on these bottlenecks. The project document, nevertheless, is not fully convincing on the demonstration of incremental costs, they seem oversized taking into account present world energy prices and the economics of wind parks elsewhere in the world. The comparison of wind park production costs with natural gas power plant costs seems biased by low gas prices below world market, and high O & M costs for wind parks which are much above usual ratios (1.5% to 3% of windmill investment cost per year). Thus, the incremental cost might be lower than quoted in project document reducing therefore the need for subsidies.

The approach of implementing a significant wind farm investment while addressing all legal, technical and financial barriers is a sound and motivating approach and it seems that there is a genuine interest of foreign investors in developing this first large wind park, provided that the related legal, financial and technical frameworks for IPP wind production are sufficiently developed to ensure a sufficient project visibility and a reasonable internal rate of return. A success in this first operation would open the door for subsequent wind farm developments once the business environment has been clarified.

The proposed activities are addressing most key issues; their cost estimate (5 MUS\$) seems high taking into account that most of the experience (technical, legal, financial,) is available elsewhere in developed and developing countries and transferable without major difficulties. The planned wind park capacity (60 MW) is rather small in front of total installed capacity (1,600MW) and should not generate serious technical issues.

Regarding project organization, it might be interesting to give a higher role to the NEPCO grid utility to facilitate its involvement in subsequent stages and capitalize project experience.

? **Opinion: no objection.** On the whole, the project is recommended but clarifications might be needed regarding the demonstration of incremental costs, the use of GEF contribution and project organization.

Response to Comments

<p>Demonstration of incremental costs and the use of GEF contribution</p> <p>The demonstrated incremental costs are oversized due to the use of lower natural gas prices and higher O&M cost for wind farm.</p> <p>The incremental cost might be lower than quoted in project document reducing therefore</p>	<p>The promotional wind IPP project's incremental cost was revised at appraisal, resulting in an increase from US\$7.6 million to US\$37.9 million. The details of the cost revision are as follows:</p> <p>First, the Baseline power plant was changed</p>
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the need for subsidies.

from a CCGT plant to a steam thermal power plant as this is a more appropriate comparison to the wind IPP. Furthermore, the comparison is now based on optimal sizes and capacity factors for both the Baseline (26.8 MW at 85% capacity factor) and the wind IPP (65 MW at 35% capacity factor). The analysis at GEF program entry assumed a larger CCGT plant, resulting in a higher Baseline's capital cost and a lower incremental cost.

Second, the economic capital cost of the Baseline was increased from US\$850/kW to US\$1,250/kW. This reflected the general rise in power equipment cost worldwide. In parallel, the cost for the wind IPP was increased from US\$1,300/kW to US\$1,813/kW.

Third, the cost of natural gas for the Baseline was increased from US\$3.4/MMBtu to US\$4.0/MMBtu. The revised cost is in accordance with the updated Jordan's National Energy Strategy, which substantially reflects the contractual cost of imported gas from Egypt. Although this cost of gas remains below international price level, it reflects the economic cost of gas to Jordan.

Fourth, the fixed and variable O&M unit costs for both the Baseline and the wind IPP were kept unchanged. The 1.25 US cents/kWh variable O&M unit cost for a wind farm already reflected efficiency gained from prior projects worldwide.

The revised incremental cost will be met by the proposed GEF grant, the GoJ's contribution, and tariff increases. The remaining balance of the proposed GEF grant is earmarked towards the technical assistance and project development support components of the overall Promotion of a Wind Power Market project.

<p>Project organization It might be interesting to give a higher role to the NEPCO grid utility to facilitate its involvement in subsequent stages and capitalize project experience.</p>	<p>The project's institutional and implementation arrangements were updated at appraisal. NEPCO is now involved in the early stage of the project, which will include providing technical support to the to-be-established Project Coordination Unit. NEPCO will also benefit from the technical assistance component in building NEPCO's capacity to incorporate wind power to the grid.</p>
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c) Response to Comments from the UNDP

World Bank's June 2006 Council submission: CC/OP 6: Promotion of a Wind Power Market Project in Jordan

Comment: Apart from the proposed 1.5 US cent per kWh production subsidy requested from the GEF, neither a strong commitment nor an expression of interest by the envisaged project partners to financially support the suggested 60MW wind farm (by a premium feed-in tariff or otherwise) seems to be in place yet. The project claims to create the required conditions to leverage this financing and other required support during project implementation, which, however, is associated with a high risk of failure. These concerns are strengthened by the experiences and challenges faced by the somewhat similar UNDP project in Tunisia and WB project in Egypt.

Response: Agreement was reached that most of the incremental cost will be absorbed by the average bulk tariff from all sources of supply.

Comment: Reaching an agreement with NEPCO / Government of Jordan on a power purchasing price, which would be attractive enough for the targeted private investors is obviously a key to the success of the project. The cash flow analysis has been made with an assumed power purchasing price of 6.8 US cents per kWh (including a 1.5 US cent GEF subsidy), but there is no evidence about the readiness of NEPCO to sign such a PPA.

Response: The updated analysis shows an even higher value and there is now commitment from the government and NEPCO to pay this cost.

Comment: In general, there is a question about the adequacy of the support and interest that the project can show at this stage to facilitate GEF approval, as some recently submitted UNDP projects with a similar arrangement to leverage co-financing during the project implementation were rejected, because this strategy was not considered to be adequate to meet the GEF requirements.

Response: The issue with the previous bids was the fact that NEPCO and the government were not willing to pay the higher cost of wind power compared to the counterfactual source – natural gas. This was following the receipt of several bids for two proposed sites. The levelized tariffs then (2004) were in

the range of 6.7 to 8.8 cents. Similar interest is expected this time around, albeit the levelized tariff will be higher, and the government and NEPCO are willing to accept the higher tariffs. The project is in line with the government's strategy for achieving 7% of energy supply from renewable sources by 2015. Without wind power, which offers the least cost solution out of all renewable sources in Jordan, the target cannot be achieved.

Annex 17: MAP OF JORDAN
JORDAN: PROMOTION OF A WIND POWER MARKET

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