

Environmental and Social Action Plan (ESAP) – Jordan: ACWA POWER

Date: May 11, 2011

Note 1: ACWA POWER retained an independent environmental consulting firm (5 Capitals) to conduct an environment audit of CEGCO's operations in 2010. ACWA POWER's technical team reviewed the findings and recommendations of the audit report (dated October 2010) and conducted further due diligence. This ESAP summarizes the ACWA POWER's planned actions to improve the environmental, health and safety performance of CEGCO and other supplemental actions to bring CEGCO's operations in compliance with IFC Performance Standards (IFC PSs).

Note 2: Actions summarized in the ESAP includes some additional field investigations of the current environmental areas of concerns identified by the due diligence. In determining what additional environmental mitigation investments to make in relation to all the action items in this document, ACWA POWER shall considering the following factors depending on the category of the CEGCO's assets:

- (i) Set of plants that have 5 years (up to 2016) or less than 5 years to be decommissioned: This category includes four power plants – Hussein plant which has received exemptions from meeting the Jordanian Environmental Standards and three other old simple cycle gas turbine plants (Marka, Karak and Amman South plants). Considering the relatively short period of remaining operational life of the plants, ACWA Power's focus shall be to monitor the environmental parameters, and review and improve existing operational practices in order to improve the current compliance status with Jordanian Environmental Standards.
- (ii) Set of plants that have Power Purchase Agreements (PPAs) that are running more than 5 years or those that have the decommissioning date longer than 5 years: ACWA Power will put in place more robust environmental monitoring systems for checking environmental exceedances as per the Jordanian Environmental Standards and focus on areas for improvement to meet the Jordanian Environmental Standards and good international industry practice. The remaining life of the operation years, cost benefit analysis of additional mitigation measures, the current level of environmental risks and liabilities and interlinkages with and implications on the PPAs will be considered in determining the detailed additional mitigation measures to implement.
- (iii) New plants set up whether through repowering/re-engineering of existing plants of CEGCO or by setting up new greenfield projects: ACWA Power shall develop such new plants in full compliance with the IFC Performance Standards. Proper allocation of budgets will be made to these plants which will be fully recovered through appropriate tariffs agreed with the offtaker.

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PS1 -1	A corporate level ESMS (Environmental and Social Management System) is needed.	ACWA POWER will work with CEGCO to review the existing practices and develop a corporate level ESMS, define environmental and social management goals and initiate actions on the existing issues / matters. This review will also include areas for improvement to meet IFC Performance Standards (e.g. grievance mechanisms, general framework for land acquisition and compensation, biodiversity conservation, indigenous peoples and cultural heritage).	Development of a corporate level EMS	Within 1 year from the date when ACWA POWER takes control of CEGCO. [a] an ESMS would be developed as part of Change Management Plan / action. [b] Please refer to note 2 at the beginning of the table.
PS1 -2	Environmental Permits: The existing plants do not have environmental operational permits that are referred to in Jordanian Environmental Law and Regulations (2003 – 2009).	ACWA POWER will work with CEGCO to check with Ministry of Environment to confirm whether exemptions were granted, and if not, apply for necessary permits.	Documents granting exemptions or copies of the environmental operational permits	Within 1 year from the date when ACWA POWER takes control of CEGCO.

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PS1-3	Jordanian new environmental standards: It is understood that MoE will review the "1189/2006 Environmental Standards for Point Source Emissions" in 2011.	Monitor the development of new regulations, evaluate the compliance requirements, and formulate and implement a compliance plan.	Evaluation report, compliance plan.	Evaluation report: Within 3 months from the effective date of the new regulation. This will be in the form of a "Proposed Compliance Plan". As any change of an environmental standard is covered by an appropriate compensation mechanism to enable CEGCO to absorb the adverse financial impact of compliance with the change as per the PPA, ACWA Power will need to seek NEPCO approval to the same. The approved Compliance Plan shall then be implemented on the basis that NEPCO shall agree a financial compensation mechanism to put CEGCO in the same financial state as before. Compliance plan (preparation): Within 6 months from the effective date of the new regulation.
PS1-4	HSE and O&M practices need improvement: Detailed training programs and management plans will need to be undertaken.	Strengthen Health, Safety and Environment (HSE) training programs, and management system.	HSE training program, HSE management system improvement plan.	Within 3 months from the date when ACWA POWER takes control of CEGCO a plan to improve the HSE and O&M practices will be developed and the implementation of the same shall begin.

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PS2 -1	Labor and Working Conditions: A review of Human Resources (HR) policy and procedures of CEGCO is needed to comply with IFC Performance Standard 2 (PS2) on Labor and Working conditions.	ACWA POWER and CEGCO will review the current HR policy and procedures and strengthen, as appropriate, to include IFC PS2 elements (e.g. information regarding employees' rights, wages and benefits, working conditions, employment terms, non-discrimination and equal opportunities). In case retrenchment of employees is planned, ACWA POWER and CEGCO will follow procedures in line with Jordanian and IFC PS2 requirements.	Updated description of HR policy and procedures.	Within 4 months from the date when ACWA POWER takes control of CEGCO
PS2 -2	Health and safety management: Since the privatization of CEGCO in 2006, health and safety management systems and practices are understood to have improved. A review of the current systems to identify areas of improvement to meet good international industry practice is planned.	ACWA POWER and CEGCO will review the current health and safety management practices and systems to identify areas for improvement to meet good international industry practice (e.g. procedures, reporting lines, identification of hazardous working areas, health and safety training programs, documentation and reporting of occupational accidents and incidents, emergency preparedness plans).	Review report	Review report: Within 4 months from the date when ACWA POWER takes control of CEGCO

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PS3 -1	Inadequate bunding for fuel storage tanks: - Bund wall at Amman South Station is damaged - Bunding capacity is less than 110% of the tank capacity	ACWA POWER, together with CEGCO, will start a detailed study of the existing arrangements and its design criteria, mobilize necessary civil contractor to enhance / replace the existing bunding system as necessary.	Summary reporting describing that all the bunds are fixed.	December 31, 2012 A plan for the enhancement/replacement of the existing bunding shall be undertaken following the principle outlined in Note 2 above
PS3 -2	Degraded airshed at Hussein Thermal Power Station (HTPS) and high sulfur content in the HFO fuel: Ambient sulfur dioxide (SO ₂) quality levels are reported to exceed relevant Jordanian air quality standards. Contributing entities include HTPS, the refinery, vehicular traffic and other industries in the airshed. The HFO supplied by the Ministry of Energy and Mineral Resources (MEMR) contain sulfur around 3.6% to 3.8% wt at HTPS. An exemption for HTPS SO ₂ emission is allowed until 2015 (end of the PPA).	Conduct an ambient air quality evaluation study (AAQES). Formulate and implement an air pollution management plan (APMP) to minimize HTPS's contribution and to ensure compliance with relevant Jordanian standards. APMP will include exploring possibilities of using global HFO (with sulfur of < 1%) currently planned for IPP projects in Jordan. AAQES should quantify HTPS's impacts. APMP should consider IPP projects in the airshed, cost-benefit of pollution control measures, and the new Jordanian environmental standards foreseen.	AAQES report, and APMP for HTPS.	AAQES and formulaion of APMP: December 31, 2011. Implementation of APMP: According to the APMP. Note: Any use of HFO (with Sulfur less than 1%) shall be subject to acceptance by NEPCO and JPRC who as the fuel supplier are within their rights currently to supply a higher sulfur content HFO as fuel and the same cannot be rejected by CEGCO.

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PS3-3	High sulfur content in the HFO fuel at Aqaba Thermal Power Station (ATPS): The HFO supplied by the MEMR contain sulfur around 3.6 % to 4% wt at ATPS. Aqaba is a tourist area which continues to require minimizing ATPS's air quality impacts. ATPS was converted to gas-fired using Egyptian gas but depending on the gas supply situation, HFO is to be used when needed.	Monitor SO ₂ emission while operated on HFO and evaluate ambient SO ₂ air quality levels in the airshed. Formulate and implement an air pollution management plan (APMP) to minimize ATPS's contribution to ambient air quality levels of Aqaba tourist area. APMP should consider the impacts of using HFO when gas supply is not stable. APMP will include exploring possibilities of using global HFO (with sulfur of < 1%) currently planned for IPP projects in Jordan.	SO ₂ emission monitoring and ambient SO ₂ air quality levels evaluation reports, and APMP for ATPS.	SO ₂ emission monitoring and ambient SO ₂ air quality levels evaluation: Annually. Formulation of APMP: December 31, 2011. Implementation of APMP. According to the APMP. See the same Note as above, PS3-2.
PS3-4	PCB containing transformers at HTPS: There are nine PCB containing transformers due to be decommissioned by the end of 2010. PPAs are currently extended for 3 years until 2012.	Treat and dispose PCB containing transformers upon decommissioning. ACWA POWER and CEGCO will prepare a draft PCB treatment plan, submit to Ministry of Environment (MoE), finalize the plan and implement.	PCB treatment plan, Completion report.	PCB treatment plan: Within 6 months of IFC disbursement. Completion report: According to the PCB treatment plan.
PS3-5	Asbestos liabilities: Central Aqaba Station (CAS: not in use any more) has asbestos to be disposed. Marka Power Station (MPS) has asbestos in the ceiling of a warehouse.	CAS: Clarify with ASEZA who is to remove and dispose asbestos. Marka Power Station (MPS): Complete removal of asbestos.	CAS: Evidence showing clarification. MPS: Removal completion report.	December 31, 2011. In Marka as there are spares stored in the warehouse it will take some time to replace the roof sheets etc and therefore, within 1 year from ACWA Power's control in CEGCO.

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PS3-6	Decommissioned HFO cement underground tanks at Marka Power Station:	Measure underground water and soil contamination levels. Formulate and implement a contamination remedial plan (CRP) in coordination with MoE.	Measurement report, a contamination remedial plan, and a completion report.	Measurement report and formulation of CRP: Within 3 months from ACWA POWER's control in CEGCO. Implementation of CRP: According to CRP timeframe.
PS3-7	Low stack heights: Except for Aqaba Thermal Power Station, the stacks of all the plants are considered to be too short for the adequate dispersion of pollutants to prevent ground level impacts on sensitive receptors.	Conduct air dispersion analysis of selected power plants to estimate impacts on ambient air quality levels. Formulate and implement low stack height mitigation plan (LSHMP).	Air dispersion analysis report	Air dispersion analysis and formulation of low stack mitigation plan: Within one year of ACWA Power's control in CEGCO Air dispersion analysis of representative units for which no air dispersion analysis has ever been carried out shall be undertaken to understand the status of compliance with relevant Environmental Standards.
PS3-8	Common discharge open channel at Aqaba Thermal Power Station (ATPS) shares with a fertilizer plant.	Clarify with the fertilizer plant about the usage of common discharge open channel and document liability.	Documentation on clarification and liability.	Within 2 months from the date when ACWA POWER takes control of CEGCO.

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PS3-9	Liability in relation to the operation and maintenance of NEPCO fuel storage tanks at ATPS: The NEPCO fuel storage tanks are operated and maintained by ATPS under a contractual agreement. Responsibility and liability of any spill or breach of the tanks and associated remediation costs are not clear.	Clarify the responsibility and liability.	Documentation clarifying the responsibility and liability.	Within 2 months from the date when ACWA POWER takes control of CEGCO
PS3-10	Air emission exceedances at ATPS and HTPS (2009): Emission monitoring data showed exceedance of dust over Jordanian standard (50 mg/m3).	Evaluate the data of exceedance, probably cause, and needed corrective action. Implement a corrective action to ensure compliance with Jordanian requirements.	Evaluation report	Within 2 months from the date when ACWA POWER takes control of CEGCO.
PS3-11	Logistic constraints at Risha Power Plant may have led to contamination. It was reported that solid waste is currently dumped outside the plant boundary in shallow pits, located on government land. Disposal site for wastewater needs to be confirmed.	Evaluate the solid waste and wastewater management performance at Reisha Power Plant.	Evaluation report	Within 2 months from the date when ACWA POWER takes control of CEGCO.

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PS3-12	Incineration waste disposal: Several of CEGCO's plants such as Risha Power Plant and Marka Power Plant have incinerator rooms with potential for toxic emissions and soil contamination from the ash and other residues.	Terminate incineration use.	Termination report.	Within 2 months from the date when ACWA POWER takes control of CEGCO.
PS3-13	Poor housekeeping at hazardous and solid waste areas: Poor housekeeping practices at the oily waste / waste dumping areas.	Conduct intrusive soil / groundwater investigations to benchmark the current site conditions. Formulate and implement a soil & groundwater contamination management plan (SGCMP). SGCMP may include installment of drip trays, containments and other means to collect the possible leakage during storage and usage. ACWA POWER and CEGCO will liaise with the certified handling contractors authorized by MoE to collect and dispose / recycle the oily waste and dump the soil waste in the MoE dedicated dump area.	Investigation report, SGCMP.	Investigation report and formulation of SGCMP: 12 months from the date when ACWA POWER takes control of CEGCO. Implementation of SGCMP: According to the SGCMP timeframe.
PS3-14	Emergency Preparedness Plans of existing thermal power stations:	ACWA POWER plans to review the adequacy and effectiveness of the existing emergency preparedness plans against good international industry practice.	Review report of the existing emergency preparedness plans.	Within 4 months from the date when ACWA POWER takes control of CEGCO.

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PS4 -1	Noise complaints at Amman South Station (ASS): A mosque and a kindergarten were built very close to ASS. Although ASS is operating on a peaking mode, complaints are raised by those nearby sensitive receptors.	Measure noise levels when ASS operates. Formulate and implement noise management plan (NMP). NMP may include checking and improvement of the turbine compartment sealing and acoustic insulation, implementing any modifications of the boundary wall as found effective to attenuate noise levels.	Measurement report, and noise management plan.	Both within 1 year from the date when ACWA Power takes control of CEGCO.