NS-44 - The Zarqa River Basin Industrial Waste Water Treatment Plant and Energy Plant(ZIWWTEP)

Jordan

NAMA Seeking Support for Implementation

A Overview

A.1 Party	Jordan
A.2 Title of Mitigation Action	The Zarqa River Basin Industrial Waste Water Treatment Plant and Energy Plant(ZIWWTEP)
A.3 Description of mitigation action	Based on the sampling study being conducted under the aegis of a related USAID program, and using the lower input effluent figure of 3,000m3 per day, an IWWTE project based on this NAMA design is likely to produce in the order of 850 tones of biogas per year, which will generate 1,805 MWh of electricity and 506 MWh of utile heat. In addition, the IWWTP should produce in the order of 772,200 m3 per annum of utile water (not potable). In addition the design of the IWWTP will capitalize on local geography to make use of gravity for the transportation of liquids to reduce energy consumption for water and groundwater pumping, generally recognized to be an energy intensive activity throughout the region
A.4 Sector	[X] Energy supply [ ] Residential and Commercial buildings [X] Agriculture [ ] Waste management [ ] Transport and its Infrastructure [X] Industry [ ] Forestry [ ] Other
A.5 Technology	[ ] Bioenergy [X] Energy Efficiency [ ] Hydropower [ ] Wind energy [ ] Carbon Capture and Storage [ ] Land fill gas collection [ ] Cleaner Fuels [ ] Geothermal energy [ ] Solar energy [ ] Ocean energy [ ] Low till / No till [X] Other Methane Capture
A.6 Type of action	[ ] National/ Sectoral goal [ ] Strategy [ ] National/Sectoral policy or program [ ] Project: Investment in machinery [X] Project: Investment in infrastructure [ ] Project: Other [ ] Other
A.7 Greenhouse gases covered by the action	[ ] CO2 [ ] N2O [ ] PFCs [X] CH4 [ ] HFCs [ ] SF6

☐ Other	

B National Implementing Entity

B.1.0	Name	Ministry of Environment
B.1.1	Contact Person 1	AHMAD ALQATARNEH, SECRETARY GENERAL
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B.1.6	Address	
B.1.7	Phone	
B.1.8	Email	
B.1.9	Contact Person 3	
B.1.10	Address	
B.1.11	Phone	
B.1.12	Email	
B.1.13	Comments	

C Expected timeframe for the implementation of the mitigation action

C.1	Number of years for completion	
C.2	Expected start year of implementation	2014

D Currency

D.1	Used Currency	AED Conversion to USD: 1

E Cost

E.1.1	Estimated full cost of implementation	12000000
E.1.2	Comments on full cost of implementation	
E.2.1	Estimated incremental cost of implementation	
E.2.2	Comments on estimated incremental cost of implementation	

F Support required for the implementation the mitigation action

F.1.1	Amount of Financial support	
F.1.2	Type of required Financial support	☒ Grant ☐ Loan (sovereign) ☐ Loan (Private) ☐ Concessional loan ☐ Guarantee ☐ Equity ☐ Carbon finance ☐ Other
F.1.3	Comments on Financial support	1-Support from Green Climate Fund 2- Investments
F.2.1	Amount of Technological support	
F.2.2	Comments on Technological support	
F.3.1	Amount of capacity building support	
F.3.2	Type of required capacity building support	☒ Individual level ☒ Institutional level ☒ Systemic level ☐ Other
F.3.3	Comments on Capacity Building support	Capacity building with Government and private sector stakeholders to enable them to prepare low carbon projects and/ or programs and procure public private partnerships, In the case

	of the Zarqa IWWTE Pilot NAMA Project, the analysis undertaken to date has shown that the potential key stakeholders would include: •The Ministry of Environment, The Ministry of Water and Irrigation, which has responsibility for domestic waste water treatment, has the most experience in preparing and implementing PPPs and public sector procurement and has a significant pipeline of WWT projects, which could become NAMAs,The Ministry of Energy, which has the lead on renewable energy. The energy produced by the NAMA would go towards meeting the renewable energy requirements set out in the Renewable energy and energy efficiency law, National Electric Power Company (NEPCO), which will be responsible for the grid connection, The Water Authority of Jordan, which manages permitting of waste water, The Ministry of Agriculture, which issues the necessary approvals for the sale of soil improver and water for irrigation, Jordan Investment Board (JIB), which is set to play a central role in PPP development under the draft PPP law and Zarqa Chamber of Industry and its members, which is interested in the provision of a waste water treatment service to help with their environmental compliance
F.4 Financial support for implementation required	☐
F.5 Technological support for implementation required	☐
F.6 Capacity Building support for implementation required	☐

G Estimated emission reductions

G.1 Amount	13,759
G.2 Unit	MtCO2e/yr
G.3 Additional imformation (e.g. if available, information on the methodological approach followed)	• ACM0014 “Mitigation of greenhouse gas emissions from treatment of industrial wastewa-ter” • AM0020 “Baseline methodology for water pumping efficiency improvements” Version 02

H Other indicators

H.1 Other indicators of implementation	The IWWTE NAMA represents a significant departure from the business as usual case for Jordan. The innovation involves demonstrating that industrial waste water treatment can be energy positive, can contribute to low carbon growth, and through the innovative financial and ownership structuring, involving beneficiary firms, further demonstrate that waste water treatment could be a viable local business proposition in Jordan, if climate finance can be used to reduce policy, capacity and regulatory barriers. Proving the business case would also then open the way for self replicating model of low carbon growth in Jordan and perhaps the region based on local private sector investment. The NAMA has two main elements. Firstly, a technical element which involves the design, procurement, and operation of an industrial waste water treatment and energy plant which moves beyond the business as usual situation in Jordan. This infrastructure will draw on current international IWWTW “energy positive” low carbon designs, that comprises a series of stages.These stages will take into account energy efficient processes; the maximization of biogas generation by greater (and more upstream) use of anaerobic processes; the cost-saving

	potential of renewable energy generated by the biogas (both heat and electricity), which displaces expensive imported energy; and the revenue-earning potential of treated water, surplus renewable energy and carbon credits. The second element focuses on reducing the policy, regulatory and capacity barriers to this project and other similar projects in this sector. The prefeasibility study has addressed the following industrial waste water treatment requirements on a modular basis: •Capture of methane and combustion to produce electricity. •Removal of fats, oils and greases; •Reduction of chemical oxygen demand (COD) and biochemical oxygen demand (BOD); •Settling out of solids; •Treatment and conditioning of the sludge produced in the process to make them suitable for their intended use and/or disposal, and •Polishing the water (treat, filter, deionize, disinfect and condition) to a standard suitable for its intended re-use With a view to maximizing the climate change mitigation and overall environmental benefits of the industrial process, and simultaneously strengthening the economic viability of the Pilot Project, the proposed industrial and investment process was based on three stages: •Stage 1: two to four pre-treatment lines to reduce the chemical oxygen demand (COD) and bio-chemical oxygen demand (BOD) of the effluent and precipitate out sludge. Each line will be de-signed to treat effluent that falls into a particular category and will utilize technology proven for use with that category. •Stage 2: an aerobic biological stage with active nitrification/de-nitrification that will further reduce the BOD, remove sludge and clarify the effluent. Depending on the volume and characteristics of the effluent from high metals loading pre-treatment line, there might be a need for a separate second stage for this effluent but this is not considered likely based on the results of several waste water composition studies in Jordan to date. •Stage 3: the clarified effluent would undergo polishing to prepare it for its intended use. If used for irrigation, polishing might be limited to disinfecting. If used for industrial processing or for power station cooling, filtering, de-ionization and possibly reverse osmosis would be required. Sludge/ filter cake /concentrate removed in polishing will be disposed in an approved manner de-pending on its exact nature

I Other relevant information

I.1 Other relevant information including co-benefits for local sustainable development	•Social: o Improved public health, reduced odors; o Reduced incidence of respiratory illness; o Increased access to limited water resources. •Economic: o Improved capacity building in the waste water sector; o Number of direct and indirect jobs created from the project; o Reduced energy imports; o Cost savings from reduced pumping requirements; o Improved capacity building in the waste water sector; • Environmental: o Local air quality; o Reduced water extraction rates and corresponding increase in available potable water; o Better quality of effluent discharged to surface waters; o Sludge from organics stream can be used as soil improver/compost; o Improved quality of groundwater; o Avoided waste disposal of organic biomass that contributes to environmental effects; o Conservation of water resources

J Relevant National Policies strategies, plans and programmes and/or other mitigation action

J.1 Relevant National Policies	Climate Change Policy for Hashimite Kingdom of Jordan,Renewable Energy Law, 1st NAMA's project to be identified
J.2 Link to other NAMAs	

K Attachments

K	Attachments	**Title Description**
K.1	Attachment description	
K.2	File	Browse...

L Support received

L.1 Outside the Registry	
L.2 Within the Registry	**Support provided SupportType Amount Comment Date**