

QUESTIONS AND ANSWERS REPORT

<u>To:</u>	Bidders
<u>From:</u>	UNDP Lebanon
<u>Subject:</u>	Delivery, Installation, and Commissioning of the bioenergy co-generator for the successful operation of the Baalbek biogas production plant in Baalbek, Bekaa, Lebanon
<u>Reference:</u>	LEB/CO ITB/69/15
<u>Date:</u>	15 June 2015

UNDP Lebanon Procurement Unit has received several questions regarding the subject Tendering Procedure. All questions received to-date are documented below with respective answers.

Questions and Answers		
1	Q.	The Sulphur content is listed in the specification as 400ppm (section 3a, pg32) whereas drawing number BBP-06 indicates that the Scrubber should reduce a content of 2000ppm (to 200ppm). Please indicate which sulphur content should be taken into consideration. It should be noted that according to our estimates removing 2000ppm of H ₂ S at a design flow of 150m ³ /hr requires a significant amount of 'dry media'. Assuming conditions of 8000hrs/annum then approximately 24 Tonnes of media would be required. A wet scrubber would be advised in this case.
	A.	The drawings included in the tender documents are of indicative nature. According to the specifications the biogas should have a Sulfur content below 400ppm in order to operate properly and therefore a desulfurization unit is required, however the choice was left open for the bidders to select the most technically and financially suitable treatment option between dry and wet scrubber.
2	Q.	It is understood that heat recovery will be made from the generator coolant; nevertheless drawing number BBP-06 shows an 8" black steel gas flue pipe with the comment "to be connected to flue co-generator" please advise.
	A.	This pipe is outside the scope of this bid. Concerning the heat recovery, only the circulation network shown in drawing BBP-07 is to be taken into consideration.
3	Q.	Site level indicated in section 3a, pg. 32 is "Sea level to 1200m"; please indicate actual site level to apply the proper deration factor for the generator power.
	A.	The site is at around 1150m above sea level.

4	Q.	ATS (section 3a, pg 47) is indicated as being a devise with two circuit breakers; please indicate if using contactors of appropriate rating instead is accepted.
	A.	It would be acceptable to use contactors of appropriate rating instead of the two circuit breakers, however a circuit breaker should be placed before the contactors as protection.
5	Q.	Please indicate explicitly if 12 month of maintenance service should be included in the offer as per specs. Section 3a. this item is not mentioned explicitly in section 3b: "related services" nor in Section 7: "price schedule form".
	A.	The 12-month maintenance service is required though it does not have to be priced separately. The maintenance price is to be incorporated within the unit rate of the various items of the BOQ.
6	Q.	When selecting gas treatment unit we need some information about gas please provide us with required data for better selection and costing :
	A.	<ul style="list-style-type: none"> • Gas Flow in m³/hr. • Inlet gas pressure and allowable pressure drop. • Temperature of gas • Ambient temperature • RH of inlet gas and RH needed at exit of the dehumidifier. • Biogas composition, will be appreciated the biogas analysis • Any cold water available on the plant and flow rate <ul style="list-style-type: none"> • Estimation about 200 m³/hr. and should be complying with the production of 200 kW/hr. • The pressure of the gas will be variable from 5 to 25 mbar. • The cells have a heating floor system, temperature can be regulated; the plan is to run the facility at around 38-40° C. • Check climate data for Baalbek or Rayak station. • Since the facility is not operational yet and the substrate is still not produced (Sorting and Composting Facility not yet operational) for the value of the Rh should be considered the % in literature available for dry biogas production technology. In general biogas is SATURATED. • See table below:

Here a table that shows the average composition of the biogas from biowaste (Voegely et al. 2014)

Components	Symbol	Concentration (Vol-%)
Methane	CH ₄	55–70
Carbon dioxide	CO ₂	35–40
Water	H ₂ O	2 (20 °C)–7 (40 °C)
Hydrogen sulphide	H ₂ S	20–20 000 ppm (2 %)
Nitrogen	N ₂	< 2
Oxygen	O ₂	< 2
Hydrogen	H ₂	< 1
Ammonia	NH ₃	< 0.05

- Yes, there will be water on site. The flow rate is not known yet (Municipality will dig a groundwater well – at the moment water is supplied by tankers).

7	Q.	The system has 2000 ppm of H ₂ S in?
	A.	See table above.
8	Q.	The system has any emission limit?
	A.	No emission limits.
9	Q.	Reference to the ITB section 2, Data sheet item 30 ref C.15.2, the maximum duration of the contract execution is 4 month, however currently our manufacturer best delivery time for brand new manufactured engines is 6 month, is it possible to extend the contractual duration up to 7 working month from contract signature, taking into consideration that august is a holiday month in Europe.
	A.	The overall term of execution of this purchase order has been extended to become five (5) months from purchase order signature date.
10	Q.	We hereby demand a single-line wiring diagram.
	A.	Please find attached additional drawings such as electricity network, P&I, and the setting out plan as well as a single-line wiring diagram.