

QUESTIONS AND ANSWERS REPORT

<u>To:</u>	Bidders
<u>From:</u>	UNDP Lebanon
<u>Subject:</u>	Design, supply and commissioning of two Biogas systems in Domaine Taanayel Arc en Ciel Domaine - Taanayel, Bekaa and Masri Livestock - Aabdeh, Akkar - Lebanon
<u>Reference:</u>	LEB/CO ITB/187/17
<u>Date:</u>	27 November 2017

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. Domain Taanayel a- With respect to the tank mixer, is it acceptable to use a mixer with external motor and pumps (pumps will be outside the digester)? This mixer will be better for maintenance purposes. b- In the proposed design, there is no storage tank for the liquid fraction. We'll probably need to recirculate part of the liquid fraction to the pre-tank because we need to pump the mixture and to maintain the required concentration of total solids inside the digester. Is there an available tank on the domain? And if not, is it possible to add this tank to the design?	A. a-There is no issue with using an external motor and pumps. b- There is no storage tank available on the Domain. All of the digestate coming from the digester will pass through the separator; part of the liquid separator fraction should be redirected to the mixing tank, where it will be mixed with the fresh feedstocks and water in order to arrive at a pumpable mixture. The management of the remaining liquid separator fraction - and the solid fraction - is the responsibility of the Domain.
2	Q. Masri Farm a- Is there a pump for the liquid fraction in the farm or we should add one?	A. As per ITB on page 48, section 1.4.3.7.2, 7 th bullet point a pump for the liquid fraction should be quoted / provided.
3	Q. With respect to Taanayel's farm, what shall we do with the liquid digestate that is generated from the solid-liquid separator? Is it the responsibility of the contractor to treat the liquid digestate?	

	A.	In reference to clarification 1-b: “All of the digestate coming from the digester will pass through the separator; part of the liquid separator fraction should be redirected to the mixing tank, where it will be mixed with the fresh feedstocks and water in order to arrive at a pumpable mixture. The management of the remaining liquid separator fraction - and the solid fraction - is the responsibility of the Domaine.”
4	Q.	The tender was published on 7th November, could the dates for site visit be changed?
	A.	As per the UNDP portal, the ITB was posted online on October 12. And as stated in the ITB section DS 7 “Site Visits” the dates were set and the visits have been conducted.
5	Q.	Will UNDP provide VAT or Customs duty exemption documents to the awarded company. Can The customs duties and VAT be exempted by declaring this document?
	A.	No, in this particular case the end user is not tax exempted and therefore the delivery terms are DDP.
6	Q.	Will The MOU or Letter of Intent between the local partner and Artas be in English or Arabic?
	A.	The documents shall be in English language in order to be acceptable for UNDP. Otherwise if you prefer a version in Arabic together with the bid submission you shall submit an official and certified copy in English.
7	Q.	What kind of certificates shall be requested for approval non-toxic substances, recycled raw materials ...etc. has been used for the manufacturing. Most of the equipment are mechanical equipment. There is no chemicals ...etc. is the Certificate of conformity enough?
	A.	The certificate of conformity will be enough in this case.
8	Q.	The equipment can be ordered after approval of the shop drawings ...etc. and the delivery time of the equipment will be 4 months after the contract. So there is 2 months for supplying, transporting, manufacturing the equipment. This is a very tight schedule and we kindly request 2 months’ time extension for Deliverable 2. And total deliverable time would be 10 months after signing contract.
	A.	No extension will be granted for the implementation period.
9	Q.	Is there any limitation on the penalty term. It is mentioned 0,5% for each month and maximum delay should be 1 month. Considering the tight schedule of the project there might be risk exceeding this time. If there will be over 1 month delay. What would be the penalties?
	A.	The project is of limited duration and all works shall be finalized as per the bidding document within 8 months. If the contractor delays delivery over 1 month, UNDP may cancel the contract.
10	Q.	What will be the scope of insurance? Is it workmen compensation or Liability ...etc insurance?

	A.	There is a required liability insurance to cover USD 1,100,000. However in the general terms and conditions other insurances for your employees, assets, etc... are required.
11	Q.	The bid bond should be covered by one company or both companies share the bid bond amount in partial. I.e Artas provides 7.000 and partner provides 4.000 USD. But total amount will be 11.000 USD.
	A.	The bid bond shall be issued by the one company who submits the bid and who is accountable to UNDP in contractual terms. If you require to share the bid bond among two companies, both companies have to agree to set up a legally registered JV, submit the bid as JV and the bank account shall be in the name of the Joint Venture.
12	Q.	In Masri Feed stock, it is mentioned that there will also be rumen content in the manure. Those kind of parts and also blood can have a bad effect on digester. These kind of waste should be separated by client.
	A.	The separator is design to be handle separation of all fibers in the mix, rumen and blood content will be minimal in liquid manure.
13	Q.	Some equipment might need 380V 50 Hz electrical connection. It is specified 220V 50 Hz in tender documents. Is it available if the client can supply 380V in case of necessity.
	A.	There are no 380V connection available at the site.
14	Q.	What would be the training period. In normal conditions 3 days will be enough for each plant. It is not limited with a certain period. Could you clarify a certain period for the trainings?
	A.	The training period is 3 days per site for the personnel to take over the responsibility of operating and maintaining the biogas system. As per ITB 1.4.1.2 page 36 the open training session is to be 1 to 2 days depending on the covered topics' needs.
15	Q.	Considering the technical experts, 1 biogas expert planned to be from Turkey and other mechanical and electrical experts planned to be provided by our local partner Lebanon? Could you confirm if there is any obligation providing the technical experts from the main contractor?
	A.	As per ITB section 7 page 30 and 31 the proposed team should feature the required expertise. The structure and affiliation of the team is left for the JV.
16	Q.	The lagoon type digester in Masri Feedstock should have double membrane gas holder as a cover. If it is supplied a lagoon with single membrane gas holder will be cheaper but considering the radiation at site there will be risk of heat increase during summer. The digester temperature may reach critical levels. Therefore we strongly recommend double membrane gas holder. Including net system in it.

	A.	<p>Please refer to the attached document “amendments to Section 3a – Technical Specifications” in which the various changes to the original design to cater for the beneficiary’s change in the location of the biogas system have been included in red. However, and as per the original design pertaining to the digester in section 1.4.3.7.2 “Materials: flexible fibre- reinforced PVC (UV resistant), >1.2kg/m2, or HDPE sheeting (thickness 1mm). High-frequency welded.” Which is satisfied using a single membrane of 1mm thickness.</p> <p>Further, in the amendments, to ensure the proper functioning of the system in the weather conditions, “a layer of 100mm PUR plating will be placed between the hot water tubes and the earth for minimizing direct heat losses to the ground” has been added.</p>
17	Q.	<p>Mixers were not requested in Masri Feedstock. But we suggest to add a mixer. After a certain period there may be sedimentation. The solid content of the digestate will start to precipitate. After a certain period the lagoon may be needed to clean. This is unwanted work for Lagoon system because there may be risk of foil damages. We recommend using double membrane and updating the specification.</p>
	A.	<p>Please refer to the attached document “amendments to Section 3a – Technical Specifications” in which the various changes to the original design to cater for the beneficiary’s change in the location of the biogas system have been included in red. However, and as per the original design pertaining to the digester in section 1.4.3.7.2 “Materials: flexible fibre- reinforced PVC (UV resistant), >1.2kg/m2, or HDPE sheeting (thickness 1mm). High-frequency welded.” Which is satisfied using a single membrane of 1mm thickness.</p> <p>Further, a mixer has been added in order to avoid any possible sedimentation, following are the required specifications:</p> <p>“Active/mechanical mixing in the system for heat distribution and for avoiding scum layer formation. Submersible agitators and submersible pumps should be intrinsically safe according to DIN EN 50020:2003-8, and have a degree of protection IP68 according to EN 60529” also provided in the attached document “amendments to Section 3a – Technical Specifications” in section 1.4.3.7.2.</p>
18	Q.	<p>Following our visit to Masri’s Farm and according to our discussion, We cannot assure that the system will work properly during winter. As such, we would like to present the new proposed design of the biogas plant.</p>
	A.	<p>In order to ensure the proper functioning of the system during winter time, the design detailed in ITB section 1.4.3.7.2 requests a “digester heating system for maintaining temperature above 20°C at all times, by means of Digester floor heating using PEX tubing. The required heat will be supplied by the CHP unit. Maximum water temperature 50°C.”</p>

Furthermore, the following is to be added, to further ensure the desired performance of the system as detailed in the attached document “amendments to Section 3a – Technical Specifications” in the above mentioned section 1.4.3.7.2:

- A layer of 100mm PUR plating will be placed between the hot water tubes and the earth for minimizing direct heat losses to the ground.
- An active/mechanical mixing in the system for heat distribution and to avoid the formation of a scum layer. Submersible agitators and submersible pumps should be intrinsically safe according to DIN EN 50020:2003-8, and have a degree of protection IP68 according to EN 60529. (In reference to ITB section 1.4.3.7.2)

The proposed plant includes the following:

- A pump to directly transfer the liquid fraction from the storage tank to the digester.
- New insulated biodigester having a capacity of 110m³. This digester will be insulated and heated in order to establish a bacterial reservoir that will maintain the operation of the system especially during winter. A mixer should be included in this biodigester to ensure the proper operation of the system.
- a mixer for the lagoon biodigester. The capacity of the lagoon has been decreased from 900m³ to 700m³.

Moreover, since the location of the biogas plant has been changed, the location of the control room must be changed too. Is it the responsibility of the contractor to build the new control room?

Due to the beneficiary’s request to change the biogas system’s location to the edge of the farm (due to security reasons in view of the beneficiary’s new expansion plans), please find hereafter the amendment to the scope of service provided in section 1.4.1.2 of the ITB and again in section 1.4.3.5 “project functionality” highlighted in the document with the complete amendments to the designs herewith attached and entitled “amendments to Section 3a – Technical Specifications”:

- **Relocation of the existing diesel generators**
The diesel generators will be moved to the new site; when heavier equipment is to be operated (i.e. the feed mill), one of the diesel generators will be synchronised with the biogas generator, increasing the generating capacity to the required level.

As amended in the project functionality section (section 1.4.3.5) of the ITB, “The required electricity production from biogas” will follow a synchronous operation with diesel generator (approximately 24/7).

Furthermore, additional equipment is required to ensure optimum operation; as amended in section 1.4.3.6 “System Components”, a “generator house for installing the

		<p>biogas CHP unit and the existing two diesel generators, with a switch board and synchronization equipment for synchronizing the biogas CHP with one of the diesel generators” is required. The details of which are provided in the added section 1.4.3.7.9 “Generator House” and here below, in addition to a synchronization panel whose details are listed in amendment to section 1.4.3.7.10 and here below:</p> <p>Generator house (in reference to ITB section 1.4.3.7)</p> <ul style="list-style-type: none"> • The new generator house will host the biogas CHP unit, as well as the two existing diesel generators, the new switch bard, and all biogas plant control equipment. • Approximate dimensions: 8x4x3m (WxLxH), open on one of the long sides. • Armed concrete foundation, cement stone walls, corrugated iron roofing. • Ventilation slots to avoid buildup of biogas in case of leakage. • The relocation of the diesel generators will be part of the bid. <p>Switch board and synchronisation panel (in reference to ITB section 1.4.3.7.6)</p> <ul style="list-style-type: none"> • A switchboard for the regulation of internal and external energy usage shall be installed. The sizes of the electrical groups for internal uses are to be defined by the bidder. • The switch board will include a synchronization panel for synchronizing the biogas CHP and either of the existing diesel generators. Speed and voltage control units of the existing diesel generators are outdated and may require replacement in order to accomplish synchronization. • All electrical equipment should be connected to a common grounding system, which is connected to ground electrode. • The switch board shall be connected with the nearest switch board of the project beneficiary. Supply and installation of 300m ground cable (copper 4x150mm²) shall be included in the bid. <p>Finally, <u>an additional gas connection</u> will be installed inside the generator house, for (optional future) dual fueling of the diesel generators as amended in section 1.4.3.7.12.</p>
19	<p>Q.</p> <p><u>Taanayel</u></p> <p>a. capacity is 7t/d in winter, why does the separator need to have a 5t/hour capacity.</p> <p>b. The flare should operate automatically if the membrane holder gets filled, please advise why the requirement is for a manually operated flare</p> <p>A.</p> <p>a. The total feedstock is indeed 7 t/d in winter but with water / liquid separator fluid added (to reduce DM%) it can reach 10 t/d. Nevertheless, we will reduce the capacity to >3 t/h and operate it an hour longer.</p> <p>b. The flare is intended as alternative means of gas disposal when the generator is down, not as an emergency venting option (there is an overpressure valve</p>	

		for that). If gas production is structurally higher than expected, the capacity of the generator is big enough to handle excess gas (higher output, longer hours).
20	Q.	With respect to Masri plant, it is mentioned in the ITB that a CHP having a prime power rating of 34-36KW is required. Can we use an engine providing 32KW instead?
	A.	As per ITB section 1.4.3.5 page 47 “the 1-minute average maximum load is approx. 30kVA (27kW)”, in the amendment to the design provided in the document “amendments to Section 3a – Technical Specifications” a new separator has been added to the design, hence after accounting for this addition, the 32kW engine would not withstand the load. Generators in range 34 – 40 kW are recommended, especially that beyond 40kW the generator will be operating at below 50% capacity for most of the time.
21	Q.	<u>Masri Livestocks - Akkar</u> 1.1- What is the procedure of feeding the manure feedstocks from the cattle farm to the new manure collection tank 54 m3 which be installed before the 900 m3 HDPE lagoon? 1.2- We need to know the control kit model, brand name, number and the type of two diesel generators 60Kva and 100Kva installed on site and if there is any synchronization between them. and if we want to make synchronization between the CHP and one generators which one will be synchronized with CHP the 60Kva or the 100 Kva?. 1.3- In Q&A 4, the set-up of the biogas plant of Masri has been changed to a first fermenter of 110 m3 and a second of 700 m3. Is there an updated Annex produced for this? Could this also be 450 m3 and 450 m3? 1.4- The lagoon can be covered but the foil has to be able to take a pressure of 20 mbar. This means that the mechanical over and under pressure device has to open for safety when the 20 mbar is reached. Is this correct? 1.5 -With synchronization of the CHP with the diesel genset (both have to be updated with a new control system in order to “talk” with the biogas CHP), we can supply for both projects the same engine e.g. 34 kW. There is no need any more for a bigger CHP for Masri. Is this allowed and could this be modified in the Annex?
	A.	1.1 - It is the responsibility of the beneficiary (Masri Livestock) to deliver the manure to the new manure collection tank. 1.2- There is currently no synchronization, the generators are used intermittently. Electronic motor control systems are either not present or outdated and replacement should be considered in the bid if synchronization so requires. The system should allow

		<p>synchronization of either of the diesel generators (but not both simultaneously) with the biogas CHP.</p> <p>1.3- This was a proposed designed by one of the interested bidders, it was not approved by UNDP.</p> <p>The digester is HDPE lagoon sized 900 m3, it can be a single unit or multiple smaller units. As referred to by ITB section 1.4.3.7.2 bullet point 1: “Bag- or (fully closed) lagoon type digester operating in the mesophilic temperature range (20-38°C). The digester can be a single unit or multiple smaller units but we should maintain the total HRT at 60 days i.e. the combined volume should be maintained at 900m3.</p> <p>1.4- The cover should be able to withstand a pressure of 20mbar pressure but maximum normal operating pressure is 5mbar. Overpressure device should be set at 5mbar.</p> <p>1.5- No, the biogas generator at Masri needs to be sized according to question 20 answered as follows: “Generators in range 34 – 40 kW are recommended, especially that beyond 40kW the generator will be operating at below 50% capacity for most of the time.” However, a 34kW engine could be quoted for Taanayel Arcenciel.</p>
22	Q.	<p><u>2- Domaine Arc en Ciel - Taanayel</u></p> <p>2.1- What is the procedure of feeding the manure feedstock and organic waste from the composting area to the manure mixing tank which be installed before the Digester?</p> <p>2.2- What is the required daily feed stocks (tonnes per day) for the 400 m3 CSTR digester?</p> <p>2.3- There is a mechanical liquid-Solid separator to be installed on site, this separator will be installed before the CSTR digester 400 m3. the separated liquid shall it be re-fed into the digester directly; if not, how is the liquid disposed of??</p> <p>2.4- The CHP of Arc en Ciel needs to be supplied in a container. Is it possible to install it under a corrugated roof in a sound enclosure box or does it have to be in a container?</p> <p>2.5- Is there internet connections available at both sites? Do both projects have to be online so that can be seen how the plant is performing?</p> <p>2.6- Does the biogas quality measurement (%ch4, %o2, H2S ppm), also have to show up in the online data view. The same for the heat consumption of the digester, the biogas flow from the digester, the kWh produced and consumed?</p>

	A.	<p>2.1- As per ITB section 1.4.2.3: “The manure is currently removed from the stables and transported once per week to the composting site on the Domaine – which is the proposed location of the biogas plant on the Domaine. The frequency of removal can be changed.” It will remain the responsibility of the Domaine to transport the manure feedstock and the organic waste to the manure mixing tank by trucks.</p> <p>2.2- The available quantities that need to be considered are as set out in the ITB section 1.4.2.3 the average quantities are approx. 2.1 t/d in summer and 4.2 t/d in winter (including a 50% future increase)</p> <p>2.3- The separator is to be installed after the CSTR, for separating the digestate. Part of the liquid fraction will be used for mixing up with the feedstock, reducing DM so that it can be pumped into the digester. The management of the remaining fraction is the responsibility of the beneficiary; distribution as fertilizer and/or dewatering in a sand bed system will be proposed.</p> <p>2.4- The CHP container is to be installed in a container as per ITB section 1.4.2.7.3.</p> <p>2.5- As per ITB section 1.4.2.6 and 1.4.2.7.5 and 1.4.3.6 and 1.4.3.7.5, no online monitoring is required.</p> <p>2.6- As per ITB section 1.4.2.6 and 1.4.2.7.5 and 1.4.3.6 and 1.4.3.7.5, no online monitoring is required.</p>
23	<p>Q.</p> <p><u>3- General</u></p> <p>3. 1- replacement of any defective component in 2 weeks: This is a little too short especially that some components are outsourced from outside Lebanon?</p> <p>3. 2- For the generators, do they accept both generators to be of same power?</p> <p>3.3- Do the beneficiaries have a say in selecting successful bidders?</p> <p>A.</p> <p>3.1- The replacement period of any defective component could be up to a month.</p> <p>3.2- The generator at Domaine Taanayel needs to be sized according the ITB section 1.4.2.7.3 bullet 1: “Electrical capacity 35-40 kVA (28-32kW continuous power rating). As for the Masri site the generator needs to be sized according to question 20 answered as follows: “Generators in range 34 – 40 kW are recommended, especially that beyond 40kW the generator will be operating at below 50% capacity for most of the time.” Both generators could be the same capacity as long as they meet the minimum above mentioned requirement and they are not more than 10% greater than the set upper limit.</p> <p>3.3- As per ITB Section E bullet point 34. Award Criteria: “Prior to expiration of the</p>	



	period of Bid validity, UNDP shall award the contract to the qualified and eligible Bidder that is found to be responsive to the requirements of the Schedule of Requirements and Technical Specification, and has offered the lowest price (See DS No. 32)."
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