



Ministry of Finance and Treasury  
Male' Republic of Maldives

## Preparing Outer Islands for Sustainable Energy Development

### Design, Supply, Installation and Maintenance of renewable energy hybrid power plants in HaaDhaalu Atoll – Maldives

## ADDEDUM 1

Item #1.	Section 1 and 2 – Bid extension	2
Item #2.	Section 4 – Schedule No.1	3
Item #3.	Section 4 – Schedule No.4	8
Item #4.	Section 6 – Chapter 3.2.1.1 “Photovoltaic modules - General”	9
Item #5.	Section 6 – Chapter 3.2.4.7 “PV inverters - Technical concept”	9
Item #6.	Section 6 – Chapter 3.3.1 “Batteries” and Chapter 2.5 “Summary of the characteristics of the hybrid systems to be built”	10
Item #7.	Section 6 – Chapter 3.3.2 “Battery inverter”	12
Item #8.	Section 6 – Chapter 3.4.4 “Diesel power plants – technical specifications”	12
Item #9.	Section 6 – Chapter 3.7.1.1 “Power plant Control and Monitoring System”	14
Item #10.	Section 6 – Chapter 3.7.2.6 “System Parameters”	14
Item #11.	Section 6 – Chapter 16 “O&M Requirements”	14
Item #12.	Section 9 – Appendix 8 “Functional Guarantees”, clause 4.2	16
Attachments to amendment		16





### Item #1. Section 1 and 2 – Bid extension

An extension of 3 weeks of the bid submission deadline is given to the bidders to submit their offers. Therefore the new dates are as follows:

ITB 7.1	<p>Deadline for submission of requests for clarification is:</p> <p>Date: <b>August 30, 2016, Tuesday</b></p> <p>Time: <b>13:00 hours Maldivian time</b></p>
ITB20.1	<p>The bid validity period shall be <b>one hundred eighty (180) days. i.e.</b> Bids shall be valid till <b>March 25, 2017.</b></p>
ITB21.3	<p>Bid security has to be valid till at least <b>April 22, 2017.</b></p>
ITB24.1	<p>For <b>bid submission purposes</b> only, the Employer's address is</p> <p>Attention: Mr Ahmed Mujuthaba, Director General, Tender Evaluation Section, Ministry of Finance and Treasury Street address: Ameenee Magu City: Malé Country: Maldives</p> <p><b>The deadline for bid submission is</b> Date: <b>September 26, 2016 , Monday</b> Time: <b>1300 hours Maldivian time</b></p>
ITB 27.1	<p>The bid opening of Technical Bids shall take place at</p> <p>Street address: Ameenee Magu City : Malé Country: Maldives Date: <b>September 26, 2016 , Monday</b> Time: <b>1300 hours Maldivian time</b></p>





## Item #2. Section 4 – Schedule No.1

The Schedule No.1 in Section 4 “Plant and Mandatory Spare Parts Supplied from Abroad” shall be replaced by the following Schedule to be used by the Bidder to prepare his offer:

### 1 Lot represents all 13 Islands

Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
	<b>Hybrid power plants</b>							
1.	PV modules		2.27 MWp					
2.	PV roof mounting systems including fastening equipment		1 lot					
3.	PV inverters		1 lot					
4.	PV inverters mounting systems (outdoor wall mounted), canopy for protection from sun / rain and protection fence & entry door		1 lot					
5.	PV plants – other required equipment (cabling, protections, wall mounting systems for PV inverters, etc.)		1 lot					
6.	Li-ion battery storage system including housing for BESS and auxiliary equipment		≥1.495 MWh					
7.	Battery inverters		≥1.495 MW					
8.	Diesel generators, total 2.67MW , Output power PRP@25°C, accepted -5%/+20% power range	-	2.67MW	-	-	-	-	-
8.1.	- Diesel generator 50kW		1					
8.2.	- Diesel generator 60kW		1					
8.3.	- Diesel generator 80kW		2					
8.4.	- Diesel generator 100kW		3					
8.5.	- Diesel generator 125kW		6					
8.6.	- Diesel generator 350kW		1					
8.7.	- Diesel generator 1000kW		1					
9.	Upgrade of fuel systems @each generator on 5 islands to have a daily fuel tank		15					
10.	Flow meters for each existing and new diesel generator		40					
11.	Exhaust system for each new installed Diesel generator		15					
12.	Hybrid plant control systems, work stations and related accessories (1set for each island)		13 sets					
13.	Fibre Optic Cable		14,000 m					





Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
	<b>Mandatory spare parts – hybrid power plants PV and battery</b>							
14.	PV modules		≥1% of installed modules					
15.	PV inverters		≥5%, minimum 1 inverter of each type					
16.	PV module mounting assemblies		1% of installed quantity					
17.	PV module cable connectors		0.5%					
18.	DC string fuses		0.5%					
19.	Spare parts for battery storage system		According to supplier.					
20.	Battery inverter		≥5%, minimum 1 inverter of each type					
21.	Other key electrical components: cables, consumables, auxiliary, transformer, MV terminations & connectors, protection, breakers, etc.		To be defined by Bidder					
22.	Air Conditioning units		10%					
	<b>Mandatory spare parts – hybrid power plants diesel generator</b>							
23.	Lubrication oil filters (30 sets per new genset, 1 set contains the amount of filters that is required for a changing cycle)		450 sets					
24.	Fuel filters (30 sets per new genset, 1 set contains the amount of filters that is required for a changing cycle)		450 Nos.					
25.	Water filters (2 sets per new installed generator)		30 Nos.					
26.	Air filters (4 sets per island)		60 Nos.					
27.	Low lubricating oil pressure switch (1 set per new installed generator)		15 sets					
28.	High engine temperature switch (1 set per new installed generator)		15 sets					
29.	Lub oil sender (1 set per new installed generator)		15 sets					
30.	Lower engine gasket (1 set per new installed generator)		15 sets					
31.	Upper engine gasket (1 set per new installed generator)		15 sets					
32.	Front and rear seals (2 set per new installed generator)		30 sets					
	Tensioner (for charging alterna-		30 sets					





Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
	tor) (2 set per new installed generator)							
34.	AVR (1 set per new installed generator)		15 sets					
35.	Water pump (1 set per new installed generator)		15 sets					
36.	Charging alternator (1 set per new installed generator)		15 sets					
	<b>Special tools</b>							
37.	Bushing installation and removing kit		1 Set per diesel generator type					
38.	Bushing centering guide kit		1 Set per diesel generator type					
39.	Bushing drive set		1 Set per diesel generator type					
40.	Valve seat extractor (ex)		1 Set per diesel generator type					
41.	Valve spring compressor		1 Set per diesel generator type					
42.	Valve guide driver		1 Set per diesel generator type					
43.	Valve seat extractor (in)		1 Set per diesel generator type					
44.	Fuel pump wrench		1 Set per diesel generator type					
45.	Injector puller		1 Set per diesel generator type					
46.	Torque wrench adapter		1 Set per diesel generator type					
47.	Universal liner puller		1 Set per diesel generator type					
48.	Piston ring expander		1 Set per diesel generator type					
49.	Liner installation tool		1 Set per diesel generator type					
50.	Piston ring compressor		1 Set per diesel generator type					
51.	Heavy duty socket set ¾" – 1 ½" (imperial)		1 Set					
52.	Wrench set (imperial) all sizes below 1 ½"		1 Set					
	<b>Distribution grid upgrade</b>							
53.	Low Voltage multi-core, copper conductor, cross linked polyethylene (XLPE) insulated, steel wire armored (SWA), and PVC sheathed, 600/1000 Volts, power cables with associated works and accessories as per project requirement in line with	-	-	-	-	-	-	-





Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
	the latest IEC / BS standards, or other equivalent recognized reputable international standards.							
53.1.	4C x 16 sq.mm		100m					
53.2.	4C x 25 sq.mm		250m					
53.3.	4C x 35 sq.mm		3,100m					
53.4.	4C x 50 sq.mm		4,700m					
53.5.	4C x 70 sq.mm		9,300m					
53.6.	4C x 95 sq.mm		1,600m					
53.7.	4C x 120 sq.mm		12,500m					
53.8.	4C x 150 sq.mm		4,500m					
53.9.	4C x 185 sq.mm		500m					
53.10.	4C x 240 sq.mm		5,600m					
53.11.	4C x 300 sq.mm		5,200m					
54.	Low Voltage Distribution boxes, Outdoor weatherproof GRP sealed enclosures, IP 67, according to IEC 529, and insulation class II according to IEC 232, with associated accessories as per Employer's requirements		425 Nos					
55.	Modification of existing Distribution Box (DB) with associated accessories as per Employer's requirements		75 Nos					
56.	Replacement of existing Main LV distribution board in Power house with associated accessories including Generator Automatic Control system (with generator auto-synchronization for each generator), cabling and changeover/transfer of loads from existing to new distribution board as per Employer's requirements		12 Sets					
57.	Equipment for the modification of existing spare feeder in LV panel of Power House for PV Plant Incomers with associated accessories as per Employer's requirements		1 Set					
58.	<b>MCCB for Battery Energy Storage System</b>							
58.1.	MCCB- 1250A		1 No.					
58.2.	MCCB- 630A		1 No.					





Item	Description	Country of Origin	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>		Taxes and Duties
				Foreign Currency	CIP	Foreign Currency	Local Currency	
1	2	3	4	5	6	7 = 4 x 6	8	
58.3.	MCCB- 320A		1 No.					
58.4.	MCCB- 250A		1 No.					
58.5.	MCCB- 200A		4 Nos					
58.6.	MCCB- 125A		4 Nos					
58.7.	MCCB- 100A		1 No.					
<b>59.</b>	<b>Mandatory spare parts – Distribution grid upgrade</b>							
59.1.	MCCB –200A, 3P, 16kA		2 Nos					
59.2.	MCCB – 250A, 3P, 16kA		2 Nos					
59.3.	MCCB – 100A, 3P, 16kA		2 Nos					
59.4.	MCCB – 63A, 3P, 16kA		2 Nos					
59.5.	MCB – 40A SP, 10kA		5 Nos					
59.6.	MCB – 63A 3P, 10kA		5 Nos					
59.7.	RCBO-16A three pole, 10kA		5 Nos					
59.8.	Analog type Voltmeter 96mmx96mm, 0-500V AC		1 Nos					
59.9.	Voltmeter Selector Switch		1 Nos					
59.10.	Analog type Ammeter 96mmx96mm for 5A CT		1 Nos					
59.11.	Ammeter Selector Switch		1 Nos					
59.12.	One electromechanical time switch, 1 channel, 24 hour operating cycle, 15 minute minimum switching.		2 Nos					
59.13.	Indicating Lamps set, R, Y, B		3 Nos					
<b>TOTAL Column 7 to be carried forward to Schedule No. 5: Grand Summary</b>								

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies if so required.

### Country of Origin Declaration Form

Item	Description	Country





### Item #3. Section 4 – Schedule No.4

The Schedule No.4 in Section 4 “Installation and Other Services” shall be replaced by the following Schedule to be used by the Bidder to prepare his offer:

#### 1 Lot represents all 13 Islands

Item	Description	Quantity	Unit Price <sup>a</sup>		Total Price <sup>a</sup>	
			Local Currency Portion	Foreign Currency Portion	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6 = 3 x 4	7 = 3 x 5
	<b>Installation</b>					
1.	All types of survey, soil tests, excavation, site filling and development (as per international standard and formation level fixation prior site visit performed by EPC contractor), other necessary tests as per Employer's requirements described in Bidding Document	1 lot				
2.	Installation of all PV power plants	1 lot				
3.	Installation of all Diesel power plants	1 lot				
4.	Installation of all Battery storage system	1 lot				
5.	Commissioning of the whole hybrid systems	1 lot				
6.	Installation and commissioning of grid upgrade equipment (LV distribution Board, Main LV distribution board in Power houses) and associated works	1 lot				
7.	All necessary external works including roads, fencing, gates and drainage within the power plant	1 lot				
8.	Arrangement of water supply during construction and O&M period .Construction /lay suitable line and drainage system to make suitable arrangement for Module Cleaning	1 lot				
	<b>Other services</b>					
9.	O&M support services for the period of 1 year	1 lot				
10.	Overseas training program	1 lot				
11.	Overseas travel expenses	1 lot				
12.	Overseas training pocket Expenses	1 lot				
13.	Training at the site	1 per site				
14.	STI, STD and HIV/AIDS alleviation program <sup>b</sup>	1 lot				

TOTAL Columns 6 and 7 to be carried forward to Schedule No. 5: Grand Summary

Name of Bidder \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

<sup>a</sup> Specify currency in accordance with ITB 19.1 of the BDS.

<sup>b</sup> As described in SCC 22.2.7.





#### **Item #4. Section 6 – Chapter 3.2.1.1 “Photovoltaic modules - General”**

Chapter 3.2.1.1: Typo mistake: total PV capacity to be installed shall be 2.27MWp instead of 2.23MWp.

#### **Item #5. Section 6 – Chapter 3.2.4.7 “PV inverters - Technical concept”**

##### **1. Change No.1:**

The following section of Section 6, Chapter 3.2.4.7 “PV Inverters - Technical Concept” is amended as follow:

##### ***Initial version:***

“The inverters have to be installed in order to withstand prevailing climate conditions. The following concepts shall be considered, preferred concepts in descending order:

- Indoor installation in existing building: String inverter shall be installed indoor wherever locations are available. The Contractor shall install the inverters in rooms which are assigned by the Employer. Wall mounted as well as ground mounted installation may be considered.
- Indoor installation in new building: In case where no existing building / room are available the Contractor shall build a new building for inverter housing.

The inverter room shall be equipped with redundant air conditioning units, light and plug.”

##### ***Amended version (replace the initial version):***

“The inverters have to be installed in order to withstand prevailing climate conditions. All PV inverters will be mounted on outside walls of the buildings where PV power plants will be installed, at an appropriate height to allow easy maintenance. Walls will be defined together with the Employer. Moreover:

- The PV inverters shall be protected by the rain and direct solar irradiation with a corrugated roof sheet (lower edge: minimum 2m, minimum slope 10°).
- The area of the PV inverters shall be surrounded by a completely closed wire mesh fence (wire diameter  $\geq 2\text{mm}$ ) without any hole up to the corrugated roof sheet. Access through a locked door.”

##### **2. Change No.2:**

Section 6, Chapter 3.2.4.7 “PV Inverters - Technical Concept” is amended by adding the following requirements:

- Selected PV inverters shall have a maximum nominal AC rating of 30kVA





- For ease of operation and maintenance the following requirements shall be followed:
  - all PV inverters types shall be provided by a single manufacturer
  - The number of different models of PV inverter shall be limited as much as possible, with a maximum of 6 different types
- All PV inverters installed must provide the capability to control the active power by frequency droop control.

**Item #6. Section 6 – Chapter 3.3.1 “Batteries” and Chapter 2.5 “Summary of the characteristics of the hybrid systems to be built”**

Section 6, Chapter 3.3.1 and Chapter 3.3.2: To avoid any confusion in the bids, the following requirements are clarified:

- The selected battery energy storage shall be able to deliver the minimum required power as precised in the table in Chapter 2.5. (column “Battery required minimum power”). As a reminder from the tender specification, modular conceptions are highly preferred by the Employer (maximum 3 different type of battery inverters for ease of maintenance and management of spare parts)
- The Lithium-ion battery can be selected with a C-rate between 0.5 to 2C. The Battery inverter must be able to supply the required battery power as stated in the table below for at least 30 minutes for Type B and for at least 60 minutes for Type C systems. As an example, the required capacity for 1C batteries is given in the amended table of Chapter 2.5 below, but should be adapted by the bidder if battery with different C-rates are provided (e.g. for island B03 Hanimaadhoo, if the bidder wishes to install a 2C battery, a minimum capacity of 105kWh instead of 210kWh would be required).



Island	System Type	Size PV (STC)	Battery re- quired <u>mini- mum</u> power	<u>Minimum</u> required bat- tery capacity (example given for 1C battery)	New Diesel capacity to be installed (PRP @25°C)
B03 - Hanimaadhoo	Type B	330 kWp	210 kW	210 kWh	350 kW
B04 - Finey	Type C	80 kWp	60 kW	60 kWh	2 gensets: 100 kW, 60 kW
B05 - Naivaadhoo	Type B	70 kWp	45 kW	45 kWh	100 kW
B06 - Hirimaradhoo	Type C	50 kWp	40 kW	40 kWh	-
B07 - Nolvharanfaru	Type B	190 kWp	130 kW	130 kWh	125 kW
B08 - Nellaidhoo	Type B	130 kWp	85 kW	85 kWh	125 kW
B09 - Nolvhararam	Type B	180 kWp	120 kW	120 kWh	125 kW
B10 - Kurinbee	Type B	80 kWp	50 kW	50 kWh	50 kW
B12 - Kulhudhuffushi	Type B	800 kWp	520 kW	520 kWh	1000 kW
B13 - Kumundhoo	Type B	100 kWp	70 kW	70 kWh	2 gensets: 125 kW, 80kW
B14 - Neykurendhoo	Type B	80 kWp	50 kW	50 kWh	2 gensets: 125 kW, 80kW
B15 - Vaikaradhoo	Type B	70 kWp	45 kW	45 kWh	100 kW
B17 - Makunudhoo	Type B	110 kWp	70 kW	70 kWh	125 kW
<b>TOTAL</b>	-	<b>2,270 kWp</b>	<b>1,495 kW</b>	<b>1,495 kWh</b>	<b>2,670kW</b>



**Item #7. Section 6 – Chapter 3.3.2 “Battery inverter”**

Section 6 – Chapter 3.3.2: the requirement No.6 of the list is amended as followed:

**1. Change No.1:*****Initial version:***

“For island B04 and B06 inverters must be grid building. For all other islands inverters can be grid building or grid supporting.”

***Amended version (replace the initial version):***

“All selected battery inverters shall have the capability to be operated as grid building battery inverters, also for type B to allow the potential future expansion of the system by FENAKA. For islands B04 and B06 (Type C islands), they will be configured for a grid building operation. For all other 11 (eleven) Type B islands, they will be configured for a grid support operation.”

**2. Change No.2**

The batteries shall be connected to a dedicated feeder on the main LV distribution board of the powerhouse. The drawings of the Single Line Diagrams of the powerhouses of each island have been updated accordingly and can be found in Attachment No2 to the present Addendum.

**Item #8. Section 6 – Chapter 3.4.4 “Diesel power plants – technical specifications”****1. Change No.1: diesel daily tanks**

For the following 7 islands the fuel system needs to be upgraded to have new daily tanks of 360L each (suggested tank size 0.8x0.8x0.8m) and new pipes to the main fuel tank in order to be able to install fuel meters as described in Item #10:

Island code	Island Name	Number of diesel daily tanks	Tank capacity	Suggested Tank Size (LXWxH)
B04	Finey	3	360L	0.8 x 0.8 x 0.8m
B05	Naivaadhoo	2	360L	0.8 x 0.8 x 0.8m
B06	Hirimaradhoo	2	360L	0.8 x 0.8 x 0.8m
B08	Nellaidhoo	3	360L	0.8 x 0.8 x 0.8m
B10	Kurinbi	3	360L	0.8 x 0.8 x 0.8m
B13	Kumundhoo	3	360L	0.8 x 0.8 x 0.8m
B15	Vaikaradhoo	2	360L	0.8 x 0.8 x 0.8m
	<b>Total</b>	<b>18</b>		



The requirements can be found in the attached drawing in Attachment No2 "Typical fuel tank drawings". Among other, the material for the daily tank as well as the pipes shall be steel with appropriate coating specified for storage and transport of diesel fuel and to avoid corrosion.

## **2. Change No.2: diesel flow meters**

The last bullet point of the Chapter 3.4.4 shall be modified as followed:

### ***Initial version:***

"Flow meters to measure the consumed fuel at each Generator shall be installed with all existing and new gensets. The flow meters shall be digital and integrated in the PCMS."

### ***Amended version (replace the initial version):***

"Flow meters to measure the consumed fuel at each Generator shall be installed for all existing and new gensets. For all 13 islands the flow meters shall be directly installed between the daily tank of each generator and the main fuel tank according to the attached drawing in attachment No2 "Typical fuel tank drawings".

Requirements for installation:

- Before fuel flow meter contractor shall install a ball valve in order to isolate the line for maintenance of flow meters and days tanks.
- Fuel flow meter and valve shall be with flange connections and bolt connected.
- Fuel flow meters, valves and accessories shall comply in all expects to the intended use in terms of material, premises, temperature, weather, etc.
- Operating voltage and signal output cabling shall be included in the scope

Specifications for the fuel flow meters:

- Nominal Diameter: DN40
- Connection Type: Flange
- Nominal Flow Rate: 2000 to 8000L per hr
- Max Permissible error: +/- 0.2%
- Display: Flow Rate in L/hr, Volume in L
- Fuel flow meter shall have local reading and output characteristic for remote reading, preferably with RS485 connection. Local Display > 6 digits
- Output: RS-485

- Ambient Temperature: 25 to 50°C
- The flow meters shall be digital and integrated in the PCMS.
- Differential flow meters are not allowed.”

**Item #9. Section 6 – Chapter 3.7.1.1 “Power plant Control and Monitoring System”**

The SCADA System provided by the Contractor should be easily adjustable to operate either Type B or Type C without the need of extra specialist.

**Item #10. Section 6 – Chapter 3.7.2.6 “System Parameters”**

**Initial version:** Chapter 3.7.2.6

“All limits as well as minimum and maximum values of all parameters needed to configure the system shall be easy adjustable by the controller from the controlling room on site as well as from selected users online, anywhere with internet connection. The access has to be Password and Username protected.”

**Amended version (replace the initial version):** Chapter 3.7.2.6

“All limits as well as minimum and maximum values of all parameters needed to configure the system shall be easy adjustable by the controller from the controlling room on site as well as from selected users online, anywhere with internet connection. The access has to be Password and Username protected. Especially parameters like: load set-points of diesel generators, allowed ramp rates of generator, ramp rates of battery, timing of battery, all setup parameters of needed current sensors and parameters that are provided from genset controllers.”

**Item #11. Section 6 – Chapter 16 “O&M Requirements”**

Section 6, Chapter 3.16 “O&M Requirements during the one year Defect Liability period” is amended as follow:

**Initial version:** Chapter 3.16.1

“Bidder shall be responsible for the daily operation of the plant to satisfy energy delivery and provide technical and engineering support. The operation and control system of the plant system should not be limited to registration of data, but should comprise functions



for assessment and interpretation of operating conditions in particular in order to allow for remote diagnosis of errors.

Electrical load data, PV generator data and diesel engine data and the battery status (SOC) shall be acquired by the PCMS and handled within data storage, protocol, reporting and monitoring. It is mandatory that the PCMS shall retrieve all necessary data to ensure reliability and performance according to its intended purpose.

Bidder shall prepare monthly reports regarding the operation of the plant including electricity production, efficiency, fuel consumption, availability, maintenance performed.

Bidder may sub-contract the performance of parts or all of the services, subject to the approval of the Employer and on the basis that the Bidder remains fully liable for the performance of the sub- contracted obligations.

Bidder shall carry out and/or manage all planned overhaul maintenance of the plant, including major overhauls and inspections. Moreover, Bidder shall liaise with the original equipment manufacturer to identify changes in the recommendations for the monitoring and maintenance of the equipment that constitutes the plant”

***Amended version (replace the initial version):*** Chapter 3.16.1

“Bidder shall **provide only O&M support services (no daily operation of the plant is required)**. The operation and control system of the plant system should not be limited to registration of data, but should comprise functions for assessment and interpretation of operating conditions in particular in order to allow for remote diagnosis of errors.

Electrical load data, PV generator data and diesel engine data and the battery status (SOC) shall be acquired by the PCMS and handled within data storage, protocol, reporting and monitoring. It is mandatory that the PCMS shall retrieve all necessary data to ensure reliability and performance according to its intended purpose.

Bidder shall prepare monthly reports **using the remote PCMS** regarding the operation of the plant including electricity production, efficiency, fuel consumption, availability. **Any maintenance performed during the month shall also be reported and the action taken described clearly.**

Bidder may sub-contract the performance of parts or all of the services, subject to the approval of the Employer and on the basis that the Bidder remains fully liable for the performance of the sub- contracted obligations.

Moreover, Bidder shall liaise with the original equipment manufacturer to identify changes in the recommendations for the monitoring and maintenance of the equipment that constitutes the plant”



**Item #12. Section 9 – Appendix 8 “Functional Guarantees”, clause 4.2**

The last sentence of the Appendix 8 “Functional Guarantees”, clause 4.2, is amended as follow:

***Initial version:***

“The Client reserves the right to test all generators provided by the Contractor. Costs of test.”

***Amended version (replace the initial version):***

“The Client reserves the right to test all generators provided by the Contractor. Costs of these tests shall be carried by the Contractor.”

**Attachments to amendment**

Attachment No1 “Powerhouse Single Line Diagram updated”

Attachment No2 “Typical fuel tank drawings”

