ISO 9001,ISO 14001 &
ISO 45001 Certified

বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
BANGLADEASH RURAL ELECTRIFICATION BOARD

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Memo No. 27.12.0000.224.11.031.24. 643

Date: 23 .05.2026

ADDENDA
TO THE TENDER DOCUMENT

Ref. Memo No: 27.12.0000.224.11.031.24.573; Date: 19.04.2026
Tender Package No.: MCEP/BREB/ DMD-W-392 under "Modernization and Capacity Enhancement of BREB Network (Dhaka- Mymensingh Division) (1st Revised)" Project.

SL No	Tender Document Reference	Existing Entries	Amendment
1	Section 2: TDS: ITT 1.1 (last line) (Page 51)	Lot No(s): Single Lot: MCEP/BREB/DMD-W-G-392	Lot No(s): Single Lot: MCEP/BREB/DMD-W-392
2	Section 2: TDS: ITT 1.1 (Page 51)	The number, identification and name of lots comprising the Tender are: Tender Package No.: "MCEP/BREB/DMD-W-G-392"	The number, identification and name of lots comprising the Tender are: Tender Package No.: MCEP/BREB/DMD-W-392
3	Section 2: TDS: ITT 17.2: JV Table (Page 54)	The minimum qualification requirements of Leading Partner, other Partner(s) and requirements by summation of a JV shall be as follows:	The minimum qualification requirements of Leading Partner, other Partner(s) and requirements by summation of a JV shall be as follows:

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SL No	Tender Document Reference	Existing Entries	Amendment

Existing Entries

ITT Clauses References	Requirements by summation	Requirements for Leading Partner	Requirements for other Partner(s)
ITT-13.1(a)	Summation not applicable	Same as stated in TDS	Same as for Leading Partner
ITT-13.1(b)	100%	At least one Contract	Minimum requirement not applicable
ITT-14.1(b)	100%	40%	25%
ITT-14.1(c)	100%	40%	25%
ITT-14.1(d)	100%	40%	25%
ITT-15.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
ITT-16.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
ITT-17.5	100%	Maximum among the Partners	Minimum 25%

[it is suggested that the Procuring Entity adheres to the above proportion of minimum qualifying requirements to meet the specific procurement needs. Percent share of business of the JV partners shall not be considered in determining the qualifications of a JV]

Amendment

ITT Clauses References	Requirements by summation	Requirements for Leading Partner	Requirements for other Partner(s)
ITT-13.1(a)	Summation not applicable	Same as stated in TDS	Same as for Leading Partner
ITT-13.1(b)	100%	At least one Contract	Minimum requirement not applicable
ITT-14.1(b)	100%	40%	25%
ITT-14.1(c)	100%	40%	25%
ITT-15.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
ITT-16.1	100%	Minimum requirement not applicable	Minimum requirement not applicable
ITT-17.5	100%	Maximum among the Partners	Minimum 25%

[it is suggested that the Procuring Entity adheres to the above proportion of minimum qualifying requirements to meet the specific procurement needs. Percent share of business of the JV partners shall not be considered in determining the qualifications of a JV]

SL No	Tender Document Reference	Existing Entries	Amendment
4	Section 2. TDS: ITT 57.6 (d) Operation & Maintenance (O&M) Service Cost (Page 60)	**(d) Operation & Maintenance (O&M) Service Cost:** The projected operating and maintenance costs during the life of the Facilities: -The Operation and Maintenance (O&M) costs for Years 6–12 (Phase 2: O&M Contract), as quoted in Schedule 7, shall be evaluated using the LCOS formula for the purpose of bid evaluation and determination of the successful bidder for Phase 1 (EPC Contract). - The purchaser shall consider the Verification and examination of the Price Schedule for Operation & Maintenance Service for the years 6-12.	**(d) Operation & Maintenance (O&M) Service Cost:** The projected operating and maintenance costs during the life of the Facilities: - The Operation and Maintenance (O&M) costs for Years 6–12 (Phase 2: O&M Contract) shall be quoted by the Tenderer in Schedule No. 7 as per employer's requirements (O&M Services) - The purchaser shall consider the Verification and examination of the Price Schedule for Operation & Maintenance Service for the years 6-12. - The Purchaser shall carry out the verification and examination of the Price Schedule for Recommended Spare Parts.
5	Section 2. TDS: ITT 57. Price Comparison (Page 60)	Tenders that fully comply with all mandatory technical requirements shall first be screened to eliminate any identified as Significantly Low-Priced Tenders (SLT) in accordance with **ITT Clause 56**. Only those Tenders not classified as SLT shall be considered for further evaluation. Among the remaining responsive Tenders, the Employer shall carry out the price comparison based on the lowest CAPEX (the EPC Price, including local and foreign training costs) to determine the lowest evaluated Tender. To Evaluate & determine the lowest CAPEX, the LCOS formula shall be applied, as detailed in below: Proposed **Levelized Cost of Storage** (LCOS) Formula: CAPEX: Total price offered by the bidder. OPEX: Provided by the bidder Yield: 1 cycle per day during every day for 12 years=....x kwh for each bidder...	Among the responsive Tenders, the Employer shall carry out the price comparison based on CAPEX (as per Schedule No. 5: Grand Summary) and OPEX through the LCOS formula, **as detailed below**, to determine the Lowest Evaluated Tender. The Tender with the lowest evaluated cost applying the LCOS formula shall be ranked as the 1st responsive Tenderer, and the subsequent Tenderers shall be ranked accordingly. **Proposed LCOS Formula:** LCOS = (NPV of Total Lifetime Costs) / (NPV of Total Energy Discharge without replacement costs and the O&M is defined by the Employer at 2% of CAPEX (Schedule-5: Grand Summary of respective bidder). CAPEX: Total price offered by the bidder. OPEX: 2 % of the offered price (CAPEX) Yield: 1 cycle per day during every day for 12 years=....x kwh for each bidder...

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The lowest= (CAPEX + OPEX)/Yield.

$$\text{LCOS} = \frac{C_{capex} + \sum_{t=1}^{N} \frac{OM_t + R_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{E_t}{(1+r)^t}}$$

Here,

Symbol	Definition
C_{capex}	Total EPC turnkey price offered by the bidder
OM_t	Annual operation & maintenance cost in year t; Provided by the bidder
R_t	Replacement cost in year t; $=0$
E_t	Usable energy delivered in year t= Nominal MWh × availability × efficiency × retention(t) × cycles × DoD; as per the manufacturer's values with 3rd party verification; Table Provided by the bidder
N	Evaluation lifetime; 12 years
r	Discount rate for evaluation; 10 %

Bidders are to fill the table below as per the manufacturer's values with 3rd party verification:

Year	E_t: Usable Energy Delivered per year (kWh) considering 1 cycle per day	Total price (USD)
0	0	CAPEX as per schedule 5 total price
1	Energy year 1	
2	Energy year 2	
.....		
12	Energy year 12	

The lowest= (CAPEX + OPEX)/Yield.

$$\text{LCOS} = \frac{C_{capex} + \sum_{t=1}^{N} \frac{OM_t + R_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{E_t}{(1+r)^t}}$$

Here,

Symbol	Definition
C_{capex}	Total EPC turnkey price offered by the bidder
OM_t	Annual operation & maintenance cost in year t; 2% of the CAPEX
R_t	Replacement cost in year t; $=0$
E_t	Usable energy delivered in year t= Nominal MWh × availability × efficiency × retention(t) × cycles × DoD; as per the manufacturer's values. Values must be supported by evidences and/or statements from the manufacturers
N	Evaluation lifetime; 15 years
r	Discount rate for evaluation; 10 %

Bidders are to fill the table below as per the manufacturer's values. Values must be supported by evidences and/or statements from the manufacturers:

Year	E_t: Usable Energy Delivered per year (kWh) considering 1 cycle per day	Total price (USD)
0	0	CAPEX as per schedule 5 total price
1	Energy year 1	
2	Energy year 2	
.....		
12	Energy year 12	

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
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Example:

Let,

Let there be three bidders participating in the BESS project. The main financial parameters for each bidder are as follows:

1. Bidder 1: CAPEX = 10,000 USD; O&M per year = 800 USD
2. Bidder 2: CAPEX = 12,000 USD; O&M per year = 1,200 USD
3. Bidder 3: CAPEX = 12,500 USD; O&M per year = 700 USD

The project life for all bidders is 12 years, with an annual discount rate of 10% (r = 0.1).
Energy delivered by the battery degrades each year, with each bidder having a slightly different degradation profile, this table will be provided by the BIDDER.
Replacement cost is assumed zero ($R_t = 0$).

1. BIDDER 1 – LCOS CALCULATION

Given:

- CAPEX = 10,000 USD
- O&M each year = 800 USD
- Replacement cost in year, R_t = 0
- Discount rate, r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades from 12,000 kWh to 10,020 kWh over 12 years

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,820
3	11,640
4	11,460

</td><td>

Example:

Let,

Let there be three bidders participating in the BESS project. The main financial parameters for each bidder are as follows:

1. Bidder-1: CAPEX=40,000 USD; O&M per year = 800 USD (2% of Capex)
2. Bidder-2: CAPEX=60,000 USD; O&M per year=1,200 USD(2% of Capex)
3. Bidder -3: CAPEX = 35,000 USD; O&M per year = 700 USD (2% of Capex)

The project life for all bidders is 12 years, with an annual discount rate of 10% (r = 0.1).
Energy delivered by the battery degrades each year, with each bidder having a slightly different degradation profile, this table will be provided by the BIDDER.
Replacement cost is assumed zero ($R_t = 0$).

1.BIDDER 1 – LCOS CALCULATION

Given:

- CAPEX = 40,000 USD
- O&M each year = 800 USD
- Replacement cost in year, R_t = 0
- Discount rate, r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades from 12,000 kWh to 10,020 kWh over 12 years

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,820
3	11,640
4	11,460

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5	11,280
6	11,100
7	10,920
8	10,740
9	10,560
10	10,380
11	10,200
12	10,020

Formula:

$$LCOS = \frac{C_{capex} + \sum_{t=1}^{N} \frac{OM_t + R_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{E_t}{(1+r)^t}}$$

Here,

Discount Factor:

$DF_t = (1+r)^t = 1.1^t$

Discounted O&M:

$O\&M_{discounted} = \frac{O\&M_t}{DF_t} = \frac{800}{1.1^t}$

Because, $R_t = 0$

Discounted Energy:

$E_{discounted} = \frac{E_t}{DF_t}$

LCOS:

$LCOS = \frac{CAPEX - \sum_{t=1}^{12} O\&M_{discounted}}{\sum_{t=1}^{12} E_{discounted}}$

5	11,280
6	11,100
7	10,920
8	10,740
9	10,560
10	10,380
11	10,200
12	10,020

Formula:

$$LCOS = \frac{C_{capex} - \sum_{t=1}^{N} \frac{OM_t + R_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{E_t}{(1+r)^t}}$$

Here,

Discount Factor:

$DF_t = (1+r)^t = 1.1^t$

Discounted O&M:

$O\&M_{discounted} = \frac{O\&M_t}{DF_t} = \frac{800}{1.1^t}$

Because, $R_t = 0$

Discounted Energy:

$E_{discounted} = \frac{E_t}{DF_t}$

LCOS:

$LCOS = \frac{CAPEX + \sum_{t=1}^{12} O\&M_{discounted}}{\sum_{t=1}^{12} E_{discounted}}$

Bangladesh Rural Electrification Board ★ MCEP (DMD) Project ★

SL No	Tender Document Reference	Existing Entries	Amendment

Existing Entries

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	800 ÷ 1.1 = 727.27	12,000 ÷ 1.1 = 10,909.09
2	11,820	1.21	800 ÷ 1.21 = 661.16	11,820 ÷ 1.21 = 9,768.59
3	11,640	1.331	800 ÷ 1.331 = 601.05	11,640 ÷ 1.331 = 8,745.30
4	11,460	1.4641	800 ÷ 1.4641 = 546.41	11,460 ÷ 1.4641 = 7,824.07
5	11,280	1.61051	800 ÷ 1.61051 = 496.70	11,280 ÷ 1.61051 = 7,002.79
6	11,100	1.771561	800 ÷ 1.771561 = 451.92	11,100 ÷ 1.771561 = 6,279.81
7	10,920	1.948717	800 ÷ 1.948717 = 410.51	10,920 ÷ 1.948717 = 5,652.55
8	10,740	2.143589	800 ÷ 2.143589 = 373.36	10,740 ÷ 2.143589 = 5,011.83
9	10,560	2.357948	800 ÷ 2.357948 = 339.34	10,560 ÷ 2.357948 = 4,480.80
10	10,380	2.593743	800 ÷ 2.593743 = 308.39	10,380 ÷ 2.593743 = 4,002.88
11	10,200	2.853117	800 ÷ 2.853117 = 280.49	10,200 ÷ 2.853117 = 3,574.61

Amendment

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	800 ÷ 1.1 = 727.27	12,000 ÷ 1.1 = 10,909.09
2	11,820	1.21	800 ÷ 1.21 = 661.16	11,820 ÷ 1.21 = 9,768.59
3	11,640	1.331	800 ÷ 1.331 = 601.05	11,640 ÷ 1.331 = 8,745.30
4	11,460	1.4641	800 ÷ 1.4641 = 546.41	11,460 ÷ 1.4641 = 7,824.07
5	11,280	1.61051	800 ÷ 1.61051 = 496.70	11,280 ÷ 1.61051 = 7,002.79
6	11,100	1.771561	800 ÷ 1.771561 = 451.92	11,100 ÷ 1.771561 = 6,279.81
7	10,920	1.948717	800 ÷ 1.948717 = 410.51	10,920 ÷ 1.948717 = 5,652.55
8	10,740	2.143589	800 ÷ 2.143589 = 373.36	10,740 ÷ 2.143589 = 5,011.83
9	10,560	2.357948	800 ÷ 2.357948 = 339.34	10,560 ÷ 2.357948 = 4,480.80
10	10,380	2.593743	800 ÷ 2.593743 = 308.39	10,380 ÷ 2.593743 = 4,002.88
11	10,200	2.853117	800 ÷ 2.853117 = 280.49	10,200 ÷ 2.853117 = 3,574.61
12	10,020	3.138428	800 ÷ 3.138428 = 254.98	10,020 ÷ 3.138428 = 3,192.68

SL No	Tender Document Reference	Existing Entries	Amendment

12	10,020	3.138428	800 ÷ 3.138428 = 254.98	10,020 ÷ 3.138428 = 3,192.68

Total Discounted O&M:

$$\sum O\&M_{discounted} = 727.27 + 661.16 + 601.05 + 546.41 + 496.70 + 451.92 + 410.51 + 373.36 + 339.34 + 308.39 + 280.49 + 254.98 = 5,451.58\,\text{USD}$$

Total Discounted Energy:

$$\sum E_{discounted} = 10,909.09 + 9,768.59 + 8,745.30 + 7,824.07 + 7,002.79 + 6,279.81 + 5,652.55 + 5,011.83 + 4,480.80 + 4,002.88 + 3,574.61 + 3,192.68 = 76,445.00\,\text{kWh}$$

Total Cost:

Total Cost $- CAPEX + \sum O\&M_{discounted} - 10,000 + 5,451.58 - 15,451.58$ USD

LCOS:

$$LCOS = \frac{\text{Total Cost}}{\text{Total Discounted Energy}} = \frac{15,451.58}{76,445} = 0.2021\,\text{USD/kWh} = 202.1\,\text{USD/MWh}$$

BIDDER 2 – LCOS Calculation

Given:

- CAPEX = 12,000 USD
- O&M each year = 1,200 USD
- Replacement cost, R_t = 0
- Discount rate r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades from 12,000 kWh → 10,680 kWh over 12 years

Total Discounted O&M:

$$\sum O\&M_{discounted} = 727.27 + 661.16 + 601.05 + 546.41 + 496.70 + 451.92 + 410.51 + 373.36 + 339.34 + 308.39 + 280.49 + 254.98 = 5,451.58\,\text{USD}$$

Total Discounted Energy:

$$\sum E_{discounted} = 10,909.09 + 9,768.59 + 8,745.30 + 7,824.07 + 7,002.79 + 6,279.81 + 5,652.55 + 5,011.83 + 4,480.80 + 4,002.88 + 3,574.61 + 3,192.68 = 76,445.00\,\text{kWh}$$

Total Cost:

Total Cost $= CAPEX + \sum O\&M_{discounted} = 40,000 + 5,451.58 = 45,451.58$ USD

LCOS:

$$LCOS = \frac{\text{Total Cost}}{\text{Total Discounted Energy}} = \frac{45,451.58}{76,445} = 0.5945\,\text{USD/kWh} = 594.5\,\text{USD/MWh}$$

2.BIDDER 2 – LCOS Calculation

Given:

- CAPEX = 60,000 USD
- O&M each year = 1,200 USD
- Replacement cost, R_t = 0
- Discount rate r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades from 12,000 kWh → 10,680 kWh over 12 years

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SL No	Tender Document Reference	Existing Entries	Amendment

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,950
3	11,900
4	11,840
5	11,780
6	11,720
7	11,660
8	11,600
9	11,540
10	11,480
11	11,100
12	10,680

Formulas:

- Discount Factor: $DF_t = (1+r)^t = 1.1^t$
- Discounted O&M: $O\&M_{discounted} = O\&M_t / DF_t = 1{,}200/1.1^t$
- Discounted Energy: $E_{discounted} = E_t / DF_t$
- LCOS: $LCOS = (CAPEX + \sum O\&M_{discounted}) / \sum E_{discounted}$

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	1,200 ÷ 1.1 = 1,090.91	12,000 ÷ 1.1 = 10,909.09
2	11,950	1.21	1,200 ÷ 1.21 = 991.74	11,950 ÷ 1.21 =

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,950
3	11,900
4	11,840
5	11,780
6	11,720
7	11,660
8	11,600
9	11,540
10	11,480
11	11,100
12	10,680

Formulas:

- Discount Factor: $DF_t = (1+r)^t = 1.1^t$
- Discounted O&M: $O\&M_{discounted} = O\&M_t / DF_t = 1{,}200/1.1^t$
- Discounted Energy: $E_{discounted} = E_t / DF_t$
- LCOS: $LCOS = (CAPEX + \sum O\&M_{discounted}) / \sum E_{discounted}$

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	1,200 ÷ 1.1 = 1,090.91	12,000 ÷ 1.1 = 10,909.09
2	11,950	1.21	1,200 ÷ 1.21 = 991.74	11,950 ÷ 1.21 = 9,876.03
3	11,900	1.331	1,200 ÷ 1.331 = 901.58	11,900 ÷ 1.331 = 8,940.05

SL No	Tender Document Reference	Existing Entries					Amendment				
						9,876.03	4	11,840	1.4641	1,200 ÷ 1.4641 = 819.59	11,840 ÷ 1.4641 = 8,082.23
		3	11,900	1.331	1,200 ÷ 1.331 = 901.58	11,900 ÷ 1.331 = 8,940.05	5	11,780	1.61051	1,200 ÷ 1.61051 = 745.05	11,780 ÷ 1.61051 = 7,314.06
		4	11,840	1.4641	1,200 ÷ 1.4641 = 819.59	11,840 ÷ 1.4641 = 8,082.23	6	11,720	1.771561	1,200 ÷ 1.771561 = 677.88	11,720 ÷ 1.771561 = 6,618.07
		5	11,780	1.61051	1,200 ÷ 1.61051 = 745.05	11,780 ÷ 1.61051 = 7,314.06	7	11,660	1.948717	1,200 ÷ 1.948717 = 615.78	11,660 ÷ 1.948717 = 5,984.36
		6	11,720	1.771561	1,200 ÷ 1.771561 = 677.88	11,720 ÷ 1.771561 = 6,618.07	8	11,600	2.143589	1,200 ÷ 2.143589 = 559.99	11,600 ÷ 2.143589 = 5,414.19
		7	11,660	1.948717	1,200 ÷ 1.948717 = 615.78	11,660 ÷ 1.948717 = 5,984.36	9	11,540	2.357948	1,200 ÷ 2.357948 = 509.01	11,540 ÷ 2.357948 = 4,894.23
		8	11,600	2.143589	1,200 ÷ 2.143589 = 559.99	11,600 ÷ 2.143589 = 5,414.19	10	11,480	2.593743	1,200 ÷ 2.593743 = 462.59	11,480 ÷ 2.593743 = 4,424.99
		9	11,540	2.357948	1,200 ÷ 2.357948 = 509.01	11,540 ÷ 2.357948 = 4,894.23	11	11,100	2.853117	1,200 ÷ 2.853117 = 420.74	11,100 ÷ 2.853117 = 3,890.72
		10	11,480	2.593743	1,200 ÷ 2.593743 = 462.59	11,480 ÷ 2.593743 = 4,424.99	12	10,680	3.138428	1,200 ÷ 3.138428 = 382.47	10,680 ÷ 3.138428 = 3,403.66
		11	11,100	2.853117	1,200 ÷ 2.853117 = 420.74	11,100 ÷ 2.853117 = 3,890.72					

Totals

- **Total Discounted O&M** = 1,090.91 + 991.74 + 901.58 + 819.59 + 745.05 + 677.88 + 615.78 + 559.99 + 509.01 + 462.59 + 420.74 + 382.47 = **7,176.33 USD**
- **Total Discounted Energy** = 10,909.09 + 9,876.03 + 8,940.05 + 8,082.23 + 7,314.06 + 6,618.07 + 5,984.36 + 5,414.19 + 4,894.23 + 4,424.99 + 3,890.72 + 3,403.66 = **79,751.68 kWh = 79.75 MWh**
- **Total Cost** = 60,000 + 7,176.33 = **67,176.33 USD**
- **LCOS** = 67,176.33 ÷ 79,751.68 = **0.8423 USD/kWh = 842.3 USD/MWh**

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SL No	Tender Document Reference	Existing Entries	Amendment

12	10,680	3.138428	1,200 ÷ 3.138428 = 382.47	10,680 ÷ 3.138428 = 3,403.66

Totals

- **Total Discounted O&M** = 1,090.91 + 991.74 + 901.58 + 819.59 + 745.05 + 677.88 + 615.78 + 559.99 + 509.01 + 462.59 + 420.74 + 382.47 = **7,176.33 USD**
- **Total Discounted Energy** = 10,909.09 + 9,876.03 + 8,940.05 + 8,082.23 + 7,314.06 + 6,618.07 + 5,984.36 + 5,414.19 + 4,894.23 + 4,424.99 + 3,890.72 + 3,403.66 = **79,751.68 kWh = 79.75 MWh**
- **Total Cost** = 12,000 + 7,176.33 = **19,176.33 USD**
- **LCOS** = 19,176.33 ÷ 79,751.68 = **0.2404 USD/kWh = 240.4 USD/MWh**

2. **BIDDER 3 – LCOS Calculation**

Given:

- CAPEX = 12,500 USD
- O&M each year = 700 USD
- Replacement cost, R_t = 0
- Discount rate r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades faster: 12,000 kWh → 9,580 kWh

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,900
3	11,780
4	11,660
5	11,540
6	11,420
7	11,300
8	11,180

3.BIDDER 3 – LCOS Calculation

Given:

- CAPEX = 35,000 USD
- O&M each year = 700 USD
- Replacement cost, R_t = 0
- Discount rate r = 10% → 1 + r = 1.1
- Project life = 12 years
- Energy delivered degrades faster: 12,000 kWh → 9,580 kWh

Usable Energy Degradation Table:

Year	E_t (kWh)
1	12,000
2	11,900
3	11,780
4	11,660
5	11,540
6	11,420
7	11,300
8	11,180

MCEP (DMD) Project Bangladesh Rural Electrification Board

SL No	Tender Document Reference	Existing Entries	Amendment

9	11,060
10	10,840
11	10,210
12	9,580

Formulas:

- $DF_t = 1.1^t$
- Discounted O&M = 700 ÷ DF_t
- Discounted Energy = E_t ÷ DF_t
- LCOS = (CAPEX + Σ O&M_discounted) ÷ Σ E_discounted

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	700 ÷ 1.1 = 636.36	12,000 ÷ 1.1 = 10,909.09
2	11,900	1.21	700 ÷ 1.21 = 578.51	11,900 ÷ 1.21 = 9,834.71
3	11,780	1.331	700 ÷ 1.331 = 525.92	11,780 ÷ 1.331 = 8,849.35
4	11,660	1.4641	700 ÷ 1.4641 = 478.11	11,660 ÷ 1.4641 = 7,963.13
5	11,540	1.61051	700 ÷ 1.61051 = 434.61	11,540 ÷ 1.61051 = 7,168.28
6	11,420	1.771561	700 ÷ 1.771561 = 395.15	11,420 ÷ 1.771561 = 6,447.79
7	11,300	1.948717	700 ÷ 1.948717 = 359.17	11,300 ÷ 1.948717 = 5,798.22
8	11,180	2.143589	700 ÷ 2.143589 = 326.67	11,180 ÷ 2.143589 = 5,214.32
9	11,060	2.357948	700 ÷ 2.357948 = 296.87	11,060 ÷ 2.357948 = 4,692.86
10	10,840	2.59374	700 ÷ 2.593743	10,840 ÷

9	11,060
10	10,840
11	10,210
12	9,580

Formulas:

- $DF_t = 1.1^t$
- Discounted O&M = 700 ÷ DF_t
- Discounted Energy = E_t ÷ DF_t
- LCOS = (CAPEX + Σ O&M_discounted) ÷ Σ E_discounted

Calculation:

Year	E_t (kWh)	DF_t (1.1^t)	Discounted O&M (USD)	Discounted Energy (kWh)
1	12,000	1.1	700 ÷ 1.1 = 636.36	12,000 ÷ 1.1 = 10,909.09
2	11,900	1.21	700 ÷ 1.21 = 578.51	11,900 ÷ 1.21 = 9,834.71
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5	11,540	1.61051	700 ÷ 1.61051 = 434.61	11,540 ÷ 1.61051 = 7,168.28
6	11,420	1.771561	700 ÷ 1.771561 = 395.15	11,420 ÷ 1.771561 = 6,447.79
7	11,300	1.948717	700 ÷ 1.948717 = 359.17	11,300 ÷ 1.948717 = 5,798.22
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Bangladesh Rural Electrification Board ★ MCEP (DMD) Project ★

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>3</td><td>= 269.88</td><td>2.593743 = 4,177.62</td></tr>
<tr><td>11</td><td>10,210</td><td>2.853117</td><td>700 ÷ 2.853117 = 245.31</td><td>10,210 ÷ 2.853117 = 3,576.69</td></tr>
<tr><td>12</td><td>9,580</td><td>3.138428</td><td>700 ÷ 3.138428 = 223.09</td><td>9,580 ÷ 3.138428 = 3,053.11</td></tr>
</table>
Totals
• Total Discounted O&M = 5,426.90 USD
• Total Discounted Energy = 76,684.00 kWh = 76.68 MWh
• Total Cost = 12,500 + 5,426.90 = 17,926.90 USD
• LCOS = 17,926.90 ÷ 76,684 = 0.2338 USD/kWh = 233.8 USD/MWh

<u>N.B.: The values shown in the table above are provided only as an example to illustrate the calculation method. These figures shall not be considered as required, indicative, real or limiting for the bidders. All bidders must submit their own guaranteed energy values as per the manufacturers' certificates and degradation curves as well as cost figures in accordance with their proposed system design and performance using the price schedules.</u>
</td><td>
<table>
<tr><td>10</td><td>10,840</td><td>2.593743</td><td>700 ÷ 2.593743 = 269.88</td><td>10,840 ÷ 2.593743 = 4,177.62</td></tr>
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</table>
Totals
• Total Discounted O&M = 5,426.90 USD
• Total Discounted Energy = 76,684.00 kWh = 76.68 MWh
• Total Cost = 35,000 + 5,426.90 = 40,926.90 USD
• LCOS = 40,926.90 ÷ 76,684 = 0.5271 USD/kWh = 527.1 USD/MWh

<u>N.B.: The values shown in the table above are provided only as an example to illustrate the calculation method. These figures shall not be considered as required, indicative, real or limiting for the bidders. All bidders must submit their own guaranteed energy values as per the manufacturers' certificates and degradation curves as well as cost figures in accordance with their proposed system design and performance using the price schedules.</u>
</td></tr>
<tr><td>6</td><td>ITT 63
b Phase 2 – O&M Contract, para 3 (Page 66)</td><td>ITT 63
The Contract shall be awarded in two (2) distinct phases:
a. Phase 1 – EPC Contract: BESS System Design & Implementation, including a Defects Liability Period (DLP)/Warranty of Five (05) years with associated Support Services.
• The duration of implementation of the contract shall be 12 months from the date of commencement and 5 years of</td><td>ITT 63
The Contract shall be awarded in two (2) distinct phases:
a. Phase 1 – EPC Contract: BESS System Design & Implementation, including a Defects Liability Period (DLP)/Warranty of Five (05) years with associated Support Services, required equipment & accessories.
• The duration of implementation of the contract shall be 12 months from the date of commencement and 5 years of warranty period will start from the end of the completion of the contract/closeout.</td></tr>
</table>

MCEP (DMD) Project Bangladesh Rural Electrification Board

SL No	Tender Document Reference	Existing Entries	Amendment
		warranty period will start from the end of the completion of the contract/closeout. • Performance Security shall apply to Phase 1 in accordance with GCC Clause-66, Performance Security. **b. Phase 2 – O&M Contract:** Operation & Maintenance (O&M) Services for 7 years (starting from 6th year to 12th year), including the supply of spare parts during the O&M period, commencing upon the successful completion of the Defects Liability Period (DLP) under Phase 1. • Phase 2 may be awarded at the Employer's discretion based on the employer's satisfaction with the Support Services provided during the Warranty period. • Where Phase 2 is awarded, the Contractor shall be obligated to enter into a separate contract with the Employer and submit a separate Performance Security for O&M Contract, in an amount equal to ten percent (10%) of the Contract Price, no later than twenty-eight (28) days prior to the completion of the Defects Liability Period (DLP) under Phase 1. The Security shall remain valid for its full value until completion of the seven (7)-year O&M period plus an additional twenty-eight (28) days. • The contract shall be executed in accordance with the PPR 2025 rules and regulations and financed from BREB/PBS own budget.	• Performance Security shall apply to Phase 1 (Schedule 5: Grand Summary) in accordance with GCC Clause-63, Performance Security. **b. Phase 2 – O&M Contract:** Operation & Maintenance (O&M) Services for 7 years (starting from 6th year to 12th year), commencing upon the successful completion of the Defects Liability Period (DLP) under Phase 1. • Phase 2 may be awarded at the Employer's discretion based on the employer's satisfaction with the Support Services provided during the Warranty period. • O&M Contract Value shall be the amount based on the price quoted by the Tenderer in Schedule 6 and Schedule 7. • Where Phase 2 is awarded, the Contractor shall be obligated to enter into a separate contract with the Employer and submit a separate Performance Security for O&M Contract, in an amount equal to ten percent (10%) of the O&M Contract Price (Phase-2), no later than twenty-eight (28) days prior to the completion of the Defects Liability Period (DLP) under Phase 1. The Security shall remain valid for its full value until completion of the seven (7)-year O&M period plus an additional twenty-eight (28) days. • The contract shall be executed in accordance with the PPR 2025 rules and regulations and financed from BREB/PBS own budget.
7	Section 4. Particular Conditions of Contract. GCC Clause: GCC	Applicable rate for Liquidated Damages and Limitation of Liability (LD): The amount of liquidated damages or in other words Delay due to Damages for the uncompleted works or any part thereof is 0.075 of one (1%) percent of its contract price per day of delay.	Applicable rate for Liquidated Damages and Limitation of Liability (LD): The amount of liquidated damages or in other words Delay due to Damages for the uncompleted works or any part thereof is 0.075 of one (1%) percent of its contract price per day of delay.

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td>68.1

(Page 134)</td><td>The above rate applies to the price of the part of the Facilities, as quoted in the Price Schedule, for that part for which the Contractor fails to achieve Completion within the particular Time for Completion.

-The maximum deduction for Liquidated Damages: 10% (ten percent) of the final Contract Price of the whole of the Works.

<u>Performance Liquidated Damages:</u>

For energy/efficiency shortfall: LD = (Shortfall % /100) × Contract Price × 0.5 (per % shortfall)

For availability shortfall: LD = 0.1% of Contract Price per 0.1% availability shortfall.</td><td>The above rate applies to the price of the part of the Facilities, as quoted in the Price Schedule, for that part for which the Contractor fails to achieve Completion within the particular Time for Completion.

-The maximum deduction for Liquidated Damages: 10% (ten percent) of the final Contract Price of the whole of the Works.

<u>Performance Liquidated Damages:</u>

For energy/efficiency shortfall: LD = (Shortfall % /100) × Contract Price × 0.5 (per % shortfall)

For availability shortfall: LD = 0.1% of Contract Price per 0.1% availability shortfall.

<u>Liquidated Damages for Functional Guarantees</u>
The following Liquidated Damages shall apply for failure to meet the functional guarantees

LD Calculation:
<table>
<tr><th>Parameter</th><th>Shortfall</th><th>Liquidated Damages</th></tr>
<tr><td>Active Power Capacity (MW)</td><td>Below 5 MW</td><td>For each 0.1 MW below, pay BREB tariff /kWh x 100 kW x 365 days x 12 years or the number of years from which the active capacity falls below 5 MW based on the datasheets of the BESS</td></tr>
<tr><td>Usable Energy Capacity (MWh)</td><td>Below 10 MWh</td><td>For each 0.1 MWh below, pay BREB tariff /kWh x 100 kWh x 12 years or the number of years from which the active capacity falls below 10 MWh based on the datasheets of the BESS</td></tr>
<tr><td>State of Health (SOH)</td><td>Below 96%</td><td>For each 0.1% below, pay BREB tariff /kWh x 10 kWh x 12 years or the number of years from which the active capacity falls below the minimum level based on the datasheets of the BESS</td></tr>
</table></td></tr>
</table>

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<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Round Trip Efficiency (RTE)</td><td>Below 82%</td><td>For each 0.1% below, pay BREB tariff /kWh x 10 kWh x 12 years or the number of years from which the active capacity falls below the minimum level based on the datasheets of the BESS</td></tr>
<tr><td>System Availability (Annual)</td><td>Below 98%</td><td>This is covered by the performance security and GCC 63.</td></tr>
</table>
Overall Cap:
The total cumulative Liquidated Damages payable by the Contractor for failure to meet the functional guarantees at End of Life shall not exceed 10% (ten percent) of the total contract price.</td></tr>
<tr><td>8</td><td>Section 4. Particular Conditions of Contract.
Appendices
Appendix 8 Functional Guarantees

(Page 150)</td><td>3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

3.1 Production Capacity [List here the production capacity that the Contractor is to guarantee, making sure to use, as functional guarantees, the figures offered by the Contractor in its tender]

3.2 Raw Materials and Utilities Consumption [List here the guaranteed items of consumption per unit of production (e.g., kg, tons, kcal, kWh, etc.) that the Contractor is to guarantee, making sure to use, as functional guarantees, the figures offered by the Contractor in its tender]</td><td>3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

3.1 Production Capacity [List here the production capacity that the Contractor is to guarantee, making sure to use, as functional guarantees, the figures offered by the Contractor in its tender]

3.2 Raw Materials and Utilities Consumption [List here the guaranteed items of consumption per unit of production (e.g., kg, tons, kcal, kWh, etc.) that the Contractor is to guarantee, making sure to use, as functional guarantees, the figures offered by the Contractor in its tender]</td></tr>
</table>

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td></td><td></td><td>3.3 Functional Guarantees

The Contractor shall guarantee the following performance parameters at the acceptance of the Battery Energy Storage System, measured from the date of Commercial Operation (COD).

<table>
<tr><th>SL</th><th>Parameter</th><th>Guaranteed Value</th><th>Measurement Method</th></tr>
<tr><td>1</td><td>Active Power Capacity (MW)</td><td>≥5 MW</td><td>Measured at 11 kV Point of Connection</td></tr>
<tr><td>2</td><td>Usable Energy Capacity (MWh)</td><td>≥10 MWh</td><td>Measured at 11 kV Point of Connection at</td></tr>
<tr><td>3</td><td>Round Trip Efficiency (RTE)</td><td>≥82%</td><td>Measured at 11 kV Point of Connection</td></tr>
<tr><td>4</td><td>State of Health (SOH)</td><td>≥100 %</td><td>Usable energy capacity relative to Beginning of Life (BOL) capacity measured at COD</td></tr>
<tr><td>5</td><td>System Availability (Annual)</td><td>≥98%</td><td>Measured over each rolling 12-month period excluding scheduled maintenance (max 40 hours per year), grid outages beyond BESS control, and force majeure</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Section 4. Particular Conditions of Contract. Appendices</td><td>4.3 Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees (and consumption guarantees) are not attained by the Contractor, the</td><td>4.3 Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees (and consumption guarantees) are not attained by the Contractor, the Contractor shall at its own cost make good any</td></tr>
</table>

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<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td>Appendix 8 Functional Guarantees

(Page 151)</td><td>Contractor shall at its own cost make good any deficiencies until the Facilities reach any of such minimum performance levels, pursuant to GCC Sub-Clause 46.2:

(a) production capacity of the Facilities attained in the guarantee test: ninety-five percent (95%) of the guaranteed production capacity

and/or

average total cost of consumption of all the raw materials and utilities of the Facilities: one hundred and five percent (105%) of the guaranteed figures.</td><td>deficiencies until the Facilities reach any of such minimum performance levels, pursuant to GCC Sub-Clause 46.2:

(a) production capacity of the Facilities attained in the guarantee test: ninety-five percent (95%) of the guaranteed production capacity

and/or

average total cost of consumption of all the raw materials and utilities of the Facilities: one hundred and five percent (105%) of the guaranteed figures.

(b) <u>Liquidated Damages for Functional Guarantees</u>

<u>The following Liquidated Damages shall apply for failure to meet the functional guarantees</u>
LD Calculation:
<table><tr><th>Parameter</th><th>Shortfall</th><th>Liquidated Damages</th></tr><tr><td>Active Power Capacity (MW)</td><td>Below 5 MW</td><td>For each 0,1 MW below, pay BREB tariff /kWh x 100 kW x 365 days x 12 years or the number of years from which the active capacity falls below 5 MW based on the datasheets of the BESS</td></tr><tr><td>Usable Energy Capacity (MWh)</td><td>Below 10 MWh</td><td>For each 0.1 MWh below, pay BREB tariff /kWh x 100 kWh x 12 years or the number of years from which the active capacity falls below 10 MWh based on the datasheets of the BESS</td></tr><tr><td>State of Health (SOH)</td><td>Below 96%</td><td>For each 0.1% below, pay BREB tariff /kWh x 10 kWh x 12 years or the number of years from which the active capacity falls below the minimum level based on the datasheets of the BESS</td></tr></table></td></tr>
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<table>
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<tr><td>System Availability (Annual)</td><td>Below 98%</td><td>This is covered by the performance security and GCC 63.</td></tr>
</table>
Overall Cap:
The total cumulative Liquidated Damages payable by the Contractor for failure to meet the functional guarantees at End of Life shall not exceed 10% (ten percent) of the total contract price.
</td></tr>
<tr><td>10</td><td>Section 5. Tender and Contract Forms:
PG5A-1c: Letter of Authorization (heading)
(Page 160)</td><td>Letter of Authorization (Form PG5A-1A)</td><td>Letter of Authorization (Form PG5A-1c)</td></tr>
</table>

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<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td>11</td><td>Section 5: Tender and Contract Forms:
Price Schedule for Plant and Service (Form PG5A-3)
General point 1
(Page 170)</td><td>1) The Price Schedules are divided into separate Schedules as follows:
<table><tr><th>Project Phase</th><th>Price Schedule</th></tr><tr><td>Phase 1
(EPC Contract)</td><td>Schedule No. 1: Plant (including Mandatory Spare Parts) Supplied from Abroad
Schedule No. 2: Plant (including Mandatory Spare Parts) Supplied from within the Procuring Entity's Country
Schedule No. 3: Design Services
Schedule No. 4: Installation and Other Services
Schedule No. 5: Grand Summary
Schedule No. 6: Recommended Spare Parts</td></tr><tr><td>Phase 2
(O&M Contract)</td><td>Schedule No. 7:Operation & Maintenance Service (including mandatory Spare Parts)</td></tr></table></td><td>1) The Price Schedules are divided into separate Schedules as follows:
<table><tr><th>Project Phase</th><th>Price Schedule</th></tr><tr><td>Phase 1
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Schedule No. 2: Plant (including Mandatory Spare Parts) Supplied from within the Procuring Entity's Country
Schedule No. 3: Design Services
Schedule No.4: Installation and Other Services
Schedule No. 5: Grand Summary (Schedule 1+2+3+4)</td></tr><tr><td>Phase 2
(O&M Contract)</td><td>Schedule No. 6: Recommended Spare Parts
Schedule No. 7: Operation & Maintenance Service</td></tr><tr><td>Phase 1&2</td><td>Schedule No. 8: Grand Total (Schedule 5+6+7)</td></tr></table></td></tr>
<tr><td>12</td><td>Schedules of Rates and Prices Schedule No.1 - Plant and Mandatory Spare Parts Supplied from Abroad Line Item No 2.3 (Page 173)</td><td>Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.</td><td>Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.</td></tr>
</table>

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SL No	Tender Document Reference	Existing Entries	Amendment
13	Schedule No.2 - Plant and Mandatory Spare Parts Supplied from Abroad Line Item No 2.3 (Page 181)	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.
14	Section 5: Tender and Contract Forms: Price Schedule for Plant and Service (Form PG5A-3): Schedules of Rates & Prices: Schedule No. 6 (Page 194)	Schedule No. 6 - Recommended Spare Parts (see existing table below) *(must be filled)*	Schedule No. 6 - Recommended Spare Parts (see amended table below)

Existing Entries (SL 14): Schedule No. 6 - Recommended Spare Parts

Item	Description	Unit	Qty	Unit Price		Total Price	
				EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
	TOTAL						

(must be filled)

Amendment (SL 14): Schedule No. 6 - Recommended Spare Parts

Item	Description	Unit	Qty	Unit Price		Total Price	
				EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
1	LFP Battery Cell	Nos	10,000				
2	Cable Jointing /Termination Kit	Lot	1				
3	Cooling Systems	Lot	1				
4	Control Cables	Lot	1				
5	Exhaust Fan	Nos	12				
6	Monitoring Systems	Lot	1				
7	Fire	Lot	1				

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<table>
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<tr>
<td></td>
<td></td>
<td>
Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies
<table>
<tr><td>Name:</td><td>[insert full name of signatory]</td><td>Signature with Date and Seal</td></tr>
<tr><td>In the capacity of:</td><td>[insert designation of signatory]</td><td>[Sign]</td></tr>
<tr><td colspan="3">Duly authorized to sign the Tender for and on behalf of the Tenderer</td></tr>
</table>
</td>
<td>
<table>
<tr><td></td><td>Fighting Systems</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>8</td><td>PCS & Power Electronics</td><td>Lot</td><td>1</td><td></td><td></td><td></td><td></td></tr>
<tr><td>9</td><td>Protection & Auxiliaries</td><td>Lot</td><td>1</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>TOTAL</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
(must be filled)

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies
<table>
<tr><td>Name:</td><td>[insert full name of signatory]</td><td>Signature with Date and Seal</td></tr>
<tr><td>In the capacity of:</td><td>[insert designation of signatory]</td><td>[Sign]</td></tr>
<tr><td colspan="3">Duly authorized to sign the Tender for and on behalf of the Tenderer</td></tr>
</table>
</td>
</tr>
<tr>
<td>15</td>
<td>Section 5: Tender and Contract Forms:
Price Schedule for Plant and Service (Form</td>
<td>Phase 2: O&M Contract: (Awardable at the Employer's Discretion)

Operation & Maintenance (O&M) Service for the Battery Energy Storage System (BESS) Covering Years 6–12 for Dhaka-1, Mymensingh-2, Kishoreganj, and Narsingdi-1 PBS, Each with a Usable Energy Capacity of 5 MW / 10 MWh.</td>
<td>Phase 2: O&M Contract: (Awardable at the Employer's Discretion)

Operation & Maintenance (O&M) Service for the Battery Energy Storage System (BESS) Covering Years 6–12 for Dhaka-1, Mymensingh-2, Kishoreganj, and Narsingdi-1 PBS, Each with a Usable Energy Capacity of 5 MW / 10 MWh.</td>
</tr>
</table>

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td>PG5A-3): Schedules of Rates & Prices: Schedule No. 7 (Page 195)</td><td>
<u>Schedule No. 7 Operation & Maintenance Service (including mandatory Spare Parts)</u>
<table>
<tr><th>Item</th><th>Description</th><th>Unit</th><th>Quantity</th><th>Unit Price (Local Currency) BDT</th><th>Total Price</th></tr>
<tr><td>1.0</td><td colspan="5">Operation & Maintenance (For years 6-12)</td></tr>
<tr><td>1.1</td><td>Year 6:
Operation & Maintenance of the Battery Energy Storage System (BESS) for the Year ,including 24/7 operation support and SCADA/EMS monitoring; routine, preventive, predictive, and corrective maintenance, including battery checks such as State of Health (SoH), Depth of Discharge (DoD), and other system inspections; system performance monitoring and degradation tracking to ensure ≥98% availability; troubleshooting; software and firmware updates for BMS, PCS, and EMS; supply, storage, and replacement of consumables and specified</td><td>lot</td><td>4</td><td></td><td></td></tr>
</table>
</td><td>
<u>Schedule No. 7 Operation & Maintenance Service</u>
<table>
<tr><th>Item</th><th>Description</th><th>Unit</th><th>Quantity</th><th>Unit Price (Local Currency) BDT</th><th>Total Price</th></tr>
<tr><td>1.0</td><td colspan="5">Operation & Maintenance (For years 6-12)</td></tr>
<tr><td></td><td>Operation & Maintenance of the Battery Energy Storage System (BESS) for the Year ,including 24/7 operation support and SCADA/EMS monitoring; routine, preventive, predictive, and corrective maintenance, including battery checks such as State of Health (SoH), Depth of Discharge (DoD), and other system inspections; system performance monitoring and degradation tracking to ensure ≥98% availability; troubleshooting; software and firmware updates for BMS, PCS, and EMS; supply, storage, and replacement of consumables and specified spare parts; inspection and compliance of fire protection systems; adherence to national grid codes, safety, and environmental regulations; training of BREB/PBS</td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
</table>

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SL No	Tender Document Reference	Existing Entries						Amendment						
			spare parts; inspection and compliance of fire protection systems; adherence to national grid codes, safety, and environmental regulations; training of BREB/PBS personnel; preparation and submission of monthly and ad-hoc operational, maintenance, performance, and incident reports; and provision of documentation and audit support to the Employer; all in accordance with OEM recommendations, Technical Specifications, and Contract Documents.							personnel; preparation and submission of monthly and ad-hoc operational, maintenance, performance, and incident reports; and provision of documentation and audit support to the Employer; all in accordance with OEM recommendations, Technical Specifications, and Contract Documents.					
		1.2	**Year 7:** Operation & Maintenance of the Battery Energy Storage System (BESS) for the Year , including 24/7 operation support and SCADA/EMS monitoring; routine, preventive, predictive, and corrective maintenance, including battery checks such as State of Health (SoH), Depth of Discharge (DoD), and other system inspections; system performance monitoring and degradation tracking to ensure ≥98% availability;	lot	4				1.1	**Year 6: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
								1.2	**Year 7: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
								1.3	**Year 8: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
								1.4	**Year 9: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
								1.5	**Year 10: Operation & Maintenance** (including, but not limited to, the above-mentioned	site	4		

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SL No	Tender Document Reference	Existing Entries						Amendment					
			troubleshooting; software and firmware updates for BMS, PCS, and EMS; supply, storage, and replacement of consumables and specified spare parts; inspection and compliance of fire protection systems; adherence to national grid codes, safety, and environmental regulations; training of BREB/PBS personnel; preparation and submission of monthly and ad-hoc operational, maintenance, performance, and incident reports; and provision of documentation and audit support to the Employer; all in accordance with OEM recommendations, Technical Specifications, and Contract Documents.						activities/services)					
		1.3	**Year 8:**	lot	4			**1.6**	**Year 11: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
			....					**1.7**	**Year 12: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
			....						**Schedule 7: Total** (O&M: Year 6-12)				
			Schedule 7: Grand Total for Year 6-12										

(must be filled)

Note: 1. Create and use as many columns for Unit Price and Total Price as there are currencies;

2. *Inclusive all Taxes;*

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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SL No	Tender Document Reference	Existing Entries	Amendment
16	Section 5: Tender and Contract Forms: Price Schedule for Plant and Service (Form PG5A-3): Schedules of Rates & Prices: Schedule No. 8 (New addition after page 196)		**Schedule No. 8 - Grand Total** (Phase 1 & 2)

Schedule No.	Title	Total Price	
		Foreign Currency	Local Currency
5	Grand Summary (from schedule 5)		
6	Recommended Spare parts (from Schedule 6)		
7	Operation & Maintenance Service (from Schedule 7)		
8	**Grand Total**		

(must be filled)

Note: 1. Create and use as many columns for Unit Price and Total Price as there are currencies;

2. Inclusive all Taxes;

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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SL No	Tender Document Reference	Existing Entries	Amendment
17	**Section 5: Tender and Contract Forms** (Form Functional Guarantee: Table Top Para) (Page 208)	**Form Functional Guarantee** The Tenderer shall copy in the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Procuring Entity in ITT 24(n) and in the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.	**Form Functional Guarantee** The Tenderer shall copy in the left column of the table below, the identification of each functional guarantee required in the Specification and stated by the Procuring Entity in ITT 29((Documents Establishing the Eligibility and Conformity of Plant and Services) and in the right column, provide the corresponding value for each functional guarantee of the proposed plant and equipment.
18	6.1.1 General Serial No. 7 (Page 222)	7 Total Harmonic Distortion: < 2% to maintain grid code [PCS]	7 Total Harmonic Distortion (THD): Measured at the 11 kV Point of Connection (POC). Both current THD (THDi) and voltage THD (THDv) shall be ≤3% at 25% to 100% rated load and ≤5% at 10% to 25% rated load. No limit is specified below 10% load.
19	Section 6.1.1 General Clause No. 43 (Page 224)	The Black start process time will not be more than 1 minute	The Black start process time will not be more than 1 minute. The 1-minute black start time applies only to BESS internal sequence from black start command to PCS output ready at 11 kV. External switching time is excluded.
20	6.1.2 Particular: 6.1.2.1 Kaliakoir-6 33/11kV Substation (Dhaka PBS-1) Clause 2.3 (Page 225)	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.
21	6.1.2.2 Algi 33/11kV Substation (Narsingdi PBS-1) Clause 2.3 (Page 232)	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.

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SL No	Tender Document Reference	Existing Entries	Amendment
22	6.1.2.3 Pakundia-2 33/11kV Substation (Kishoreganj PBS) Clause 2.3 (Page 239)	Supply of Bi-directional Transformer: MV Transformer-Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.
23	6.1.2.4 Trishal-2 33/11kV Substation (Mymensingh PBS-2) Clause 2.3 (Page 246)	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, Dyn11, Tap changer +/- 5 %.
24	6.2.1.2 Container (Page 254)	Technical Requirements & Features Battery Containers (2 × 20 HC): ▪ Material: Corten steel, flat roof, stackable. ▪ Protection: Minimum IP54, compliant with IEC 60529 / GB4208. ▪ Insulation: Double-layer steel with Class A fire-retardant rock wool. ▪ Coating: Primer (zinc-rich) + Epoxy + Acrylic; Base frame: Asphalt. ▪ Pressure Balance: Passive vents opening at >1.2 MPa. ▪ Safe Escape: Walk-in design with emergency doors or	Technical Requirements & Features Battery Containers (2 × 20 HC): ▪ Material: Corten steel, flat roof, stackable. ▪ Protection: Minimum IP65, compliant with IEC 60529 / GB4208. ▪ Insulation: Double-layer steel with Class A fire-retardant rock wool. ▪ Coating: Primer (zinc-rich) + Epoxy + Acrylic; Base frame: Asphalt. ▪ Pressure Balance: Passive vents opening at >1.2 MPa. ▪ Safe Escape: Container design may be walk-in or non-walk-in,

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SL No	Tender Document Reference	Existing Entries	Amendment
		quick-release panels.	subject to provision of safe maintenance access, emergency egress within 10 seconds from any interior point, and emergency doors or quick-release panels.
25	6.2.1.2 Container (Page 254)	Submission Requirements & Notes • Container drawings, material and paint specs. • Signal mapping lists (BMS/PCS/EMS) with communication protocols. • Power distribution schematics, UPS sizing, critical/non-critical load diagram. • Protection coordination, insulation coordination, lightning and earthing layouts. • The BESS and all associated systems shall comply with applicable international and local standards, including but not limited to- IEC: 60529 (IP rating), 60255 (protection relays), 62109-1/2 (PCS safety), 62933-2-1 (stationary ESS), 61850 (communication), 62305 (lightning), 60071-1/2 (insulation), 60364-5-54 (earthing), 62619 (battery safety); IEEE: 1547 (interconnection), 1679.1 (BESS fire protection), 2030.11 (DER control), C37.04 (switchgear ratings); UL / NFPA: UL 9540 / 9540A (ESS safety), UL 1973 (batteries), NFPA 72 (fire alarms), NFPA 855 (ESS installation). • Deliver a 5-year warranty including spares and maintenance support.	Submission Requirements & Notes • Container drawings, material and paint specs. • Signal mapping lists (BMS/PCS/EMS) with communication protocols. • Power distribution schematics, UPS sizing, critical/non-critical load diagram. • Protection coordination, insulation coordination, lightning and earthing layouts. • The BESS and all associated systems shall comply with applicable international and local standards, including but not limited to-IEC: 60529 (IP rating), 60255 (protection relays), 62477 (PCS safety), 62933-2-1 (stationary ESS), 61850 (communication), 62305 (lightning), 60071-1/2 (insulation), 60364-5-54 (earthing), 62619 (battery safety); IEEE: 1547 (interconnection), 1679.1 (BESS fire protection), 2030.11 (DER control), C37.04 (switchgear ratings); UL / NFPA: UL 9540 / 9540A (ESS safety), UL 1973 (batteries), NFPA 72 (fire alarms), NFPA 855 (ESS installation). • Deliver a 5-year warranty including spares and maintenance support. • Provide post-warranty maintenance recommendations and

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SL No	Tender Document Reference	Existing Entries	Amendment
		• Provide post-warranty maintenance recommendations and critical spares list.	critical spares list.
26	6.2.1.4 BMS (Page 259)	All BMS components shall be designed for high precision, reliable communication, and long-term operational stability, compliant with IEC 62619, IEC 61000, IEC 61557, and IEEE 1184 standards for electrical safety, performance, and EMC compliance. Submission Requirements The bidder shall provide the following documents, drawings, and technical evidence along with the bid: • Detailed BMS architecture diagram showing BMU, BCMU, and communication layout. • Functional description covering monitoring, control, and protection features. • Technical data sheets specifying rated voltage, current, measurement accuracy, sampling rate, and communication protocols. • Software function overview, including SOC and SOH calculation logic, capacity calibration method, and data logging capability. • Safety and protection schemes, including overvoltage, undervoltage, overcurrent, overtemperature, and insulation fault responses. • Display and monitoring interface screenshots showing parameter visibility and alarm functions. • Graphical representation or plots (SOC curve, temperature vs. performance curve, and balancing	All BMS components shall be designed for high precision, reliable communication, and long-term operational stability. The BMS shall comply with applicable IEC 62619 (system-level battery safety) and IEC 61000 series (EMC) requirements for electrical safety, performance, and electromagnetic compatibility. Submission Requirements The bidder shall provide the following documents, drawings, and technical evidence along with the bid: • Detailed BMS architecture diagram showing BMU, BCMU, and communication layout. • Functional description covering monitoring, control, and protection features. • Technical data sheets specifying rated voltage, current, measurement accuracy, sampling rate, and communication protocols. • Software function overview, including SOC and SOH calculation logic, capacity calibration method, and data logging capability. • Safety and protection schemes, including overvoltage, undervoltage, overcurrent, overtemperature, and insulation fault responses. • Display and monitoring interface screenshots showing parameter visibility and alarm functions. • Graphical representation or plots (SOC curve, temperature vs. performance curve, and balancing efficiency graphs)

SL No	Tender Document Reference	Existing Entries	Amendment
		efficiency graphs) demonstrating expected system behavior under different operating conditions. List of compliance certificates (IEC 62619, IEC 61000, IEEE 1184, etc.) and relevant factory test reports.	demonstrating expected system behavior under different operating conditions. List of compliance certificates and relevant factory test reports demonstrating compliance with IEC 62619 (system-level battery safety), IEC 61000 series (EMC), and other applicable standards.
27	6.2.1.5 PCS (Page 260)	Technical Requirements and Features Protection Functions • Internal short circuit protection: Fast isolation via protection fuses and AC contactors. • Communication fault protection: ✓ Detects loss of communication with BMS/EMS; supports redundant operation using emergency stop signal. ✓ PCS shuts down automatically on communication failure when needed. • Overheat and humidity protection: Detects internal overheating or condensation; activates shutdown to prevent damage. • Flame retardancy & environmental adaptability: All cables rated for temperature and load; PCS enclosure with temperature/humidity control and protective relays. • Derating mode: PCS reduces output under high temperature instead of shutting down; local display shows warnings. • Additional protections: AC phase sequence error, grid	Technical Requirements and Features Protection Functions • Internal short circuit protection: Fast isolation via protection fuses and AC contactors. • Communication fault protection: ✓ Detects loss of communication with BMS/EMS; supports redundant operation using emergency stop signal. ✓ PCS shuts down automatically on communication failure when needed. • Overheat and humidity protection: Detects internal overheating or condensation; activates shutdown to prevent damage. • Flame retardancy & environmental adaptability: All cables rated for temperature and load; PCS enclosure with temperature/humidity control and protective relays. • Derating mode: PCS reduces output under high temperature instead of shutting down; local display shows warnings. • Additional protections: AC phase sequence error, grid voltage imbalance, AC/DC overcurrent, over/under voltage, over/under frequency, DC reverse polarity, cooling system faults, low/high voltage ride-through, anti-islanding, IGBT/module protection, and DC component exceeding

SL No	Tender Document Reference	Existing Entries	Amendment
		voltage imbalance, AC/DC overcurrent, over/under voltage, over/under frequency, DC reverse polarity, cooling system faults, low/high voltage ride-through, anti-islanding, IGBT/module protection, and DC component exceeding standards.	standards. The PCS in grid following mode shall support Low Voltage Ride Through (LVRT) capability in accordance with applicable grid code requirements.
28	6.2.1.5 PCS (Page 261)	Submission Requirements Documents & Drawings: • Single-line diagrams and layouts showing PCS, DC busbar, and AC connection to transformer. • Technical specifications of the PCS including protection functions, HMI interface and control modes. • Thermal and environmental performance validation reports. • Standards compliance certificates (IEC 62109, IEC 61439, GB/T34120, or applicable IEC standards). • Pre-charging circuit, DC/AC disconnects, and circuit breaker schematics. Operational and protection logic flow diagrams for verification.	Submission Requirements Documents & Drawings: • Single-line diagrams and layouts showing PCS, DC busbar, and AC connection to transformer. • Technical specifications of the PCS including protection functions, HMI interface and control modes. • Thermal and environmental performance validation reports. • Standards compliance certificates demonstrating compliance with IEC 62109-1 and IEC 62109-2 for PCS safety. IEC 62477-1 may be accepted as an alternative applicable standard. • Pre-charging circuit, DC/AC disconnects, and circuit breaker schematics. • Operational and protection logic flow diagrams for verification.
29	6.2.1.6 Bi-directional Transformer (Page 262)	Technical Requirements and Features • Voltage Regulation: 11 kV ± 2 × 2.5% with precise control under dynamic loads • Tap Changer: Manual or motorized with clear markings, mechanical/electromagnetic locks, optional remote operation • Short-Circuit Withstand: Minimum 4 seconds at any	Technical Requirements and Features • Voltage Regulation: 11 kV ± 2 × 2.5% with precise control under dynamic loads • Tap Changer: Manual or motorized with clear markings, mechanical/electromagnetic locks, optional remote operation • Short-Circuit Withstand: Minimum 4 seconds at any tap

SL No	Tender Document Reference	Existing Entries	Amendment
		tap position; factory test reports required • Insulation: Class F or H; high humidity, dust, and pollution resistant • Core and Windings: ✓ Grain-oriented silicon steel laminations ✓ 45° mitered joints with high-quality insulating coatings ✓ Low eddy-current losses and high mechanical robustness • Cooling System: Forced air or hybrid cooling with automatic fan control, overload protection, and fault diagnostics • Mechanical Durability: Shock and vibration resistant per IEC 60068; withstands frequent load reversals • Electrical Performance: ✓ Lightning impulse withstand ≥ 75 kV (project-specific) ✓ Short-circuit forces per IEC 60076-5 • Fire Safety: Dry-type ≥ F1 flame-retardant; oil-immersed must meet IEC 60826 / IEC 60076-14 • Standards Compliance: IEC 60076 series, IEC 60364, IEEE C57 series, EN 50588 (energy efficiency), local grid codes • Service Life: ≥ 15 years, verified through thermal,	position; factory test reports required • Insulation: Class F or H; high humidity, dust, and pollution resistant • Core and Windings: ✓ Grain-oriented silicon steel laminations ✓ 45° mitered joints with high-quality insulating coatings ✓ Low eddy-current losses and high mechanical robustness • Cooling System: Forced air or hybrid cooling with automatic fan control, overload protection, and fault diagnostics • Mechanical Durability: Shock and vibration resistant per IEC 60068; withstands frequent load reversals • Electrical Performance: ✓ Lightning impulse withstand ≥ 75 kV (project-specific) ✓ Short-circuit forces per IEC 60076-5 • Fire Safety: Dry-type ≥ F1 flame-retardant; oil-immersed must meet IEC 60826 / IEC 60076-14 • Standards Compliance: IEC 60076 series, IEC 60364, IEEE C57 series, EN 50588 (energy efficiency), local grid codes • Service Life: ≥ 15 years, verified through thermal, mechanical, and electrical endurance tests

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SL No	Tender Document Reference	Existing Entries	Amendment
		mechanical, and electrical endurance tests Optional Premium Requirements: • Load losses ≤ 0.5% at rated load • Noise ≤ 65 dB at 1 m • Partial discharge testing per IEC 60270 • Seismic and transport shock resistance • Remote monitoring and diagnostics Submission Requirements and Notes • Datasheets & Drawings: Full technical drawings including tap changer, busbar system, and core assembly • Factory Acceptance Test (FAT) Reports: ✓ Voltage regulation and tap changer operation ✓ Short-circuit withstand and overload tests ✓ Temperature rise and thermal performance (IEC 60076-2) ✓ Insulation resistance and partial discharge • Performance Details: Efficiency, losses, and noise levels • Safety & Protection: Confirm mechanical/electrical interlocks, grounding, and cooling system • EMC & Surge Protection: Provide details of filters, circuit breakers (CB), and surge protection devices (SPD) installed between PCS and transformer	Submission Requirements and Notes • Datasheets & Drawings: Full technical drawings including tap changer, busbar system, and core assembly • Factory Acceptance Test (FAT) Reports: ✓ Voltage regulation and tap changer operation ✓ Short-circuit withstand and overload tests ✓ Temperature rise and thermal performance (IEC 60076-2) ✓ Insulation resistance and partial discharge • Performance Details: Efficiency, losses, and noise levels • Safety & Protection: Confirm mechanical/electrical interlocks, grounding, and cooling system • EMC & Surge Protection: Provide details of filters, circuit breakers (CB), and surge protection devices (SPD) installed between PCS and transformer • Manuals: Operational, maintenance procedures, and recommended spares list • Type and Routine Test Reports: Include certified test results for no-load and load losses, percentage impedance, temperature rise (heat run), and other tests in accordance with IEC 60076-1. • Warranty & Performance Guarantees: ✓ Minimum 12-year service life

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>• Manuals: Operational, maintenance procedures, and recommended spares list
• Type and Routine Test Reports: Include certified test results for no-load and load losses, percentage impedance, temperature rise (heat run), and other tests in accordance with IEC 60076-1.
• Warranty & Performance Guarantees:
✓ Minimum 12-year service life
✓ ≤ 2% voltage deviation under rated load
✓ ≥ 95% efficiency at 75% load
•</td><td>✓ ≤ 2% voltage deviation under rated load
✓ ≥ 95% efficiency at 75% load
•</td></tr>
<tr><td>30</td><td>6.2.9 Detailed Technical Specifications Clause 1.19 Cycle Time (Page 286)</td><td>1.19 | Cycle Time | | The Battery System shall guarantee ≥70% capacity retention after 12 years of operation OR ≥8760 equivalent full cycles at 80% DoD (2 cycles per day for 12 years), whichever comes first | </td><td>1.19 | Cycle Time | | The Battery System shall guarantee ≥70% capacity retention after 12 years of operation OR ≥8760 equivalent full cycles at 80% DoD (1 cycle per day for 12 years), whichever comes first |</td></tr>
<tr><td>31</td><td>6.2.9 Detailed Technical Specifications B. Power Conversion System (PCS) Clause 1.25 (Page 295)</td><td>1.25 | Modes of Operation | | The PCS shall have a continuous active power rating equal to the BESS nominal power (5 MW) and shall support grid-following operation. The BESS system shall provide voltage support and frequency response in grid-connected mode, and Critical Load Backup (CLB) | </td><td>1.25 | Modes of Operation | | The PCS shall have a continuous active power rating equal to the BESS nominal power (5 MW) and shall support grid-forming operation. The BESS system shall provide voltage support and frequency response in grid-connected mode, and Critical Load Backup (CLB) to designated feeders during grid outages. |</td></tr>
</table>

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SL No	Tender Document Reference	Existing Entries						Amendment					
					to designated feeders during grid outages.								
32	6.2.9 Detailed Technical Specifications B. Power Conversion System (PCS) Clause 1.38 (Page 296)	1.38	Performance		The PCS bi-directional Transformer efficiency ≥99% at rated load, no-load losses ≤10kW, and load losses ≤57kW Percentage impedance minimum 7% (according to IEC60076-5)			1.38	Performance		The PCS bi-directional Transformer efficiency ≥99% at rated load, no-load losses ≤10kW, and load losses ≤57kW at 75°C for oil immersed transformer and 115°C for dry type transformer at full load as per IEC60076. Percentage impedance minimum 7% (according to IEC60076-5)		
33	6.2.13 Technical Requirement and Guarantee Schedule to be filled up by the Tenderer Guaranteed Technical Particulars A. Battery and Battery Container Clause 1.19 Cycle Time (Page 327)	1.19	Cycle Time		The Battery System shall guarantee ≥70% capacity retention after 12 years of operation OR ≥8760 equivalent full cycles at 80% DoD (2 cycles per day for 12 years), whichever comes first			1.19	Cycle Time		The Battery System shall guarantee ≥70% capacity retention after 12 years of operation OR ≥8760 equivalent full cycles at 80% DoD (1 cycle per day for 12 years), whichever comes first		
34	6.2.13 Technical Requirement and Guarantee Schedule to be filled up by the Tenderer	1.8	Total current waveform distortion (THDi)		<=2% (rated power) to maintain grid code			1.8	Total current waveform distortion (THDi)		<=3% (rated power) to maintain grid code		

<table>
<tr><th>SL No</th><th>Tender Document Reference</th><th>Existing Entries</th><th>Amendment</th></tr>
<tr><td></td><td>Guaranteed Technical Particulars

B. Power Conversion System (PCS)
Clause 1.8
(Page 336)</td><td></td><td></td></tr>
<tr><td>35</td><td>6.2.13 Technical Requirement and Guarantee Schedule to be filled up by the Tenderer Guaranteed Technical Particulars

MV bi-directional transformer
Clause 1.38
(Page 339)</td><td>1.38 | Performance | | The PCS bi-directional Transformer efficiency ≥99% at rated load, no-load losses ≤10kW, and load losses ≤57kW Percentage impedance minimum 7% (according to IEC60076-5)</td><td>1.38 | Performance | | The PCS bi-directional Transformer efficiency ≥99% at rated load, no-load losses ≤10kW, and load losses ≤57kW <u>at 75°C for oil immersed transformer and 115°C for dry type transformer at full load as per IEC 60076.</u> Percentage impedance minimum 7% (according to IEC60076-5)</td></tr>
<tr><td>36</td><td>SCHEDULE- G
O&M services (O&M)
4.PERFORMANCE GUARANTEES & KPIs</td><td>4.PERFORMANCE GUARANTEES & KPIs
<table><tr><th>Parameter</th><th>Requirement</th></tr><tr><td>Annual System Availability</td><td>≥ 98%</td></tr><tr><td>Mean Time to Repair (MTTR)</td><td>≤ 24 hours</td></tr><tr><td>Emergency Response Time</td><td>≤ 2 hours</td></tr><tr><td>Safety Incidents</td><td>Zero</td></tr></table></td><td>4.PERFORMANCE GUARANTEES & KPIs
<table><tr><th>Parameter</th><th>Requirement</th></tr><tr><td>Annual System Availability</td><td>≥ 98%</td></tr><tr><td>Mean Time to Repair (MTTR)</td><td>≤ 24 hours</td></tr><tr><td>Emergency Response Time</td><td>≤ 2 hours</td></tr><tr><td>Safety Incidents</td><td>Zero</td></tr></table></td></tr>
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<tr><td></td><td>(Page 377)</td><td>
<table>
<tr><td>Battery SOH</td><td>As per OEM curve</td></tr>
</table>

Failure to meet KPIs may result in penalties (Liquidated Damages) as per BREB contract conditions. Detailed penalties are as follows:

a. System Availability Penalty
<table>
<tr><th>Annual Availability Achieved</th><th>Penalty</th></tr>
<tr><td>≥ 98%</td><td>No penalty</td></tr>
<tr><td>≥ 97% and < 98%</td><td>1% of the annual O&M price for the affected site</td></tr>
<tr><td>≥ 95% and < 97%</td><td>3% of the annual O&M price for the affected site</td></tr>
<tr><td>< 95%</td><td>5% of the annual O&M price for the affected site</td></tr>
</table>

Availability shall be calculated per site on an annual basis, excluding BREB-approved outages

Maximum Penalties shall be capped at 2% of the annual O&M price per site.</td><td>
<table>
<tr><td>Battery SOH</td><td>As per OEM curve</td></tr>
</table>

Failure to meet KPIs may result in penalties (Liquidated Damages) as per BREB contract conditions. Detailed penalties are as follows:

a. System Availability Penalty
<table>
<tr><th>Annual Availability Achieved</th><th>Penalty</th></tr>
<tr><td>≥ 98%</td><td>No penalty</td></tr>
<tr><td>≥ 97% and < 98%</td><td>1% of the annual O&M price for the affected site</td></tr>
<tr><td>≥ 95% and < 97%</td><td>3% of the annual O&M price for the affected site</td></tr>
<tr><td>< 95%</td><td>5% of the annual O&M price for the affected site</td></tr>
</table>

Annual Availability shall be defined and measured as follows:
Availability is defined as the ratio of available operating hours to total annual hsours, expressed as a percentage.

<u>Availability = (Total Annual Hours – Downtime Hours) / Total Annual Hours × 100%</u>

<u>Total annual hours shall be taken as 8,760 hours, representing 365 days at 24 hours per day.</u>

<u>Downtime hours include any period during which the BESS is unable to</u></td></tr>
</table>

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SL No	Tender Document Reference	Existing Entries	Amendment
			deliver rated power or perform its intended functions due to equipment failure, malfunction, or system fault. The following periods shall be excluded from the downtime calculation: • Scheduled preventive maintenance, not exceeding 40 hours per calendar year • Grid outages occurring upstream of the Point of Connection beyond BESS control • Force majeure events as defined in the General Conditions of Contract • Time awaiting grid restoration following a grid outage • Scheduled testing and commissioning activities agreed in writing with BREB Availability shall be measured at the 11 kV Point of Connection. Availability shall be calculated per site on an annual basis, excluding BREB-approved outages Maximum Penalties shall be capped at **2% of the annual O&M price per site**.

All other terms and conditions remain unchanged as stipulated in tender document. This addendum will be integral part of the tender document.

Attachment- Appendix-1

28/05/2026

(Mohammad Ali)
Project Director

Copy for kind information to:
1. Chief Engineer (Project), BREB, Dhaka.
2. PS to Chairman, BREB, Dhaka.
3. PS to Member (Distribution and Operation), BREB, Dhaka.
4. M/s .....

Appendix-1

Schedules of Rates and Prices

Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad

Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
1	**Battery Prefabricated Cabin. 5MWh Per container**						
1.1	Supply of Battery cell 280Ah or more, Battery Module (Liquid cooling) 104S1P or equivalent and Battery Cluster (Liquid cooling) 416S1P or equivalent		Set	2 x 4			
1.2	Supply of Battery Management System (BMS) including BMU, BCU, BAU		Set	2 x 4			
1.3	Supply of High voltage control box including connectors, circuit breakers, relays, fuses, pre chargers, switching power supplies, etc. and boxes		Set	2 x 4			
1.4	Supply of Battery rack, including frame body, door panel, side panel, installation accessories and packaging.		Set	2 x 4			
1.5	Supply of Control and Current combining cabinet, including low-voltage power distribution unit, UPS, DC circuit breaker, bus bar, wiring, cabinet, etc. and packaging.		Set	2 x 4			
1.6	Supply of DC cables and accessories, including inner cluster and cluster to bus cabinet cable and accessories.		Set	2 x 4			
1.7	Supply of Battery Container, Standard 20 feet Container, IP 65 or higher, RAL7035, outdoor type or available size as per the site condition		Set	2 x 4			
1.8	Supply of Temperature control system, liquid cooling units, pipes and coolants.		Set	2 x 4			

Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
1.9	Supply of Fire protection system, Perfluorohexanone and Water spray system		Set	2 x 4			
1.10	Supply of Video surveillance system, including infrared camera, switch etc. The video surveillance system shall consist of industrial-grade IP cameras with minimum 1080p resolution, built-in infrared illumination, PoE power (IEEE 802.3af/at), and IP54 or higher protection. Cameras shall be rated for 24/7 continuous operation in enclosed electrical environments as per manufacturer datasheet. An industrial-grade managed PoE switch shall be supplied.		Set	2 x 4			
2	**Power Conversion System (PCS) Container, integrated with Medium Voltage (11kV) System**						
2.1	Supply of Containerized solution with PCS and bi-directional transformers, outdoor type, IP65 or better, Color RAL7035, Standard 40 feet container or available size as per the site condition.		Set	1 x 4			
2.2	Supply of Power Conversion System (PCS)-Bidirectional Power Conversion System. Grid-forming mode.		Set	1 x 4			
2.3	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.		Set	1 x 4			
3	**Supply of Energy Management System (EMS) with complete solution for integration with existing substation and BESS.**		Set	1 x 4			
4	**Supply of 1500V DC, 690V AC & Communication cable as per requirements to complete the Installation work.**		Set	1 x 4			
5	**11KV Cables and OFC Cables**						
5.1	Supply of 11kV 3-phase 185 mm², XLPE, Cu AC cable and OFC (Optic Fiber Cable) including their joints, earthing system, bonding etc. with all accessors required to complete the work (BESS output to Switchgear Panel inside the control room) and wherever required.		Lot	1 x 4			

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Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
5.2	Supply of Termination of 11kV 3-phase 185mm², XLPE Cu AC cable and OFC cable from BESS output to new switchgear panel inside control room with all accessories to complete the work and wherever required.		Lot	1 x 4			
6	**Extension of existing 11kV Busbar**						
6.1	Supply of 11kV Bus bar which shall be extended either side of existing panels to accommodate new bus section switchgear panel with/or without bus raiser, new BESS switchgear panel and 2 nos outgoing feeder panels, incoming panel wherever required after rearrangements of busbar components, similar/compatible with existing switchgear panel as per SLD. Should be Similar/Compatible with existing 11kV switchgear panels for integration.		Lot	1 x 4			
7	**Supply of new 11kV Air Insulated Switchgear (AIS) Bus Section panel with/or without bus raiser**						
7.1	Supply of new 11kV Air Insulated Switchgear (AIS) Bus Section panel with/or without bus raiser, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables , OFC cable including all associated electrical/mechanical equipment with necessary wiring/ cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear panels for integration		No	1 x 4			
8	**Supply of new 11kV Air Insulated Switchgear (AIS) Outgoing Panel for BESS Connection**						

Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
8.1	Supply of new 11kV Air Insulated Switchgear (AIS) Outgoing Panel for BESS connection, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables, OFC cable including all associated electrical/mechanical equipment with necessary wiring/ cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear panels for integration.		No	1 x 4			
9	**LV AC cables/ DC Cables/ Control Wiring**						
9.1	Supply of LV AC and DC Cables, Battery and Battery Chargers, Light and Lighting Protection equipment, Earthing system, ACDB, DCDB, SCADA, Equipment, RTUs, Control Cables etc. as per requirement to complete the work in new and existing switchgear panels and continuation with existing control wiring and wherever required. should be Similar/Compatible with existing switchgear panels for integration.		Lot	1 x 4			
10	**11kV Cable Terminations**						
10.1	Supply of 11kV cable terminations and jointing kits complete with all associated electrical equipment in new and existing switchgear Panels and wherever required. (Extra One incomer rearrangement in Trishal)		Set	2x4 +1x1 (Trishal)			
11	**Auxiliary Supply for BESS System**						

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Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
11.1	Supply of a complete auxiliary power system to ensure uninterrupted and reliable operation of the BESS under all operating conditions, including normal grid-connected operation and Critical Load Backup (CLB) to designated feeders during grid outages. This shall include, but not be limited to, suitable transformers and all associated equipment required to power auxiliary loads such as PCS units, battery enclosures, control systems, HVAC, lighting, safety, and protection systems. All components necessary to meet the functional, safety, and performance requirements of the PSA and applicable standards shall be provided, regardless of whether explicitly mentioned. No omission of any essential auxiliary provision will be accepted.		No	1 x 4			
12	**SCADA Workstation & Software and modification**						
12.1	Supply of SCADA system for Real time monitoring and control. which shall incorporate the existing substation's components for complete monitoring and control of the entire Substation & BESS system and Integration with power grid system		Set	1 x 4			
13	**Earthing System**						
13.1	Supply of Earthing system including grounding cables and accessories based on IEEE 80-2013. Chemical/plate/rod earthing for battery and encloser, PCS, transformers, lightning protection etc. wherever and whatever required to get earthing resistance less than 0.5 ohm.		Lot	1 x 4			
14	**Fire Fighting System**						
14.1	Supply of Fire Fighting system. Should comply with NFPA-855 requirements or any other relevant requirements.		Lot	1 x 4			
15	**Miscellaneous Requirement**						
15.1	Office Rooms, (1 nos. executive table, 1 nos. Revolving chair, 4 nos. visiting chair, 1 nos. file cabinet, 1 set computer table and as required) as per approved design & drawing and instruction of Engineer-in charge /Employer.		Lot	1 x 4			

Line-Item No	Description of Item	Country of Origin	Unit	Quantity	Unit Price [Final Destination] [Foreign Currency]	Price per Line Item [Foreign Currency]	Taxes and Duties In Local Currency
1	2	3	4	5	6	7 = 5 x 6	8
15.2	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Employer.		Lot	1 x 4			
15.3	CCTV System with 06 IP Cameras suitable for place and necessary accessories required for fitting & fixing up to commissioning.		Lot	1 x 4			
15.4	Desktop Computer including all accessories/components (Monitor, CPU, Printer, UPS and etc.) as per approved design & drawing and instruction of Engineer-in-charge /Employer.		No	1 x 4			
15.5	Laptop Computer including all accessories/components		No	1 x 4			
16	**Any other Miscellaneous requirements**						
16.1	Any other items(s) considered necessary to comply with the scope of Works for completing the works.		L/S	1 x 4			
	Sub-Total Schedule No. 1 =						
Column 6 to be carried forward to Schedule No. 5. Grand Summary							

Note: 1. The Procuring Entity may also use other INCOTERMs, if deemed necessary, In such case Form PG5A-6, will require to be customized by the Procuring Entity
2. *Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies.*

Country of Origin Declaration Form

Item	Description	Country

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Procuring Entity's Country

Line-Item No.	Description of Item	Unit	Quantity	Unit Price EXW (Foreign Currency or Taka)	Total EXW Price (Foreign Currency or Taka)	Sales Tax (Foreign Currency or Taka)	Total Price (Foreign Currency or Taka)
1	2	3	4	5	6 = 4 x 5	7	8 = 6 + 7
1	**Battery Prefabricated Cabin. 5MWh Per container**						
1.1	Supply of Battery cell 280Ah or more, Battery Module (Liquid cooling) 104S1P or equivalent and Battery Cluster (Liquid cooling) 416S1P or equivalent	Set	2 x 4				
1.2	Supply of Battery Management System (BMS) including BMU, BCU, BAU	Set	2 x 4				
1.3	Supply of High voltage control box including connectors, circuit breakers, relays, fuses, pre chargers, switching power supplies, etc. and boxes	Set	2 x 4				
1.4	Supply of Battery rack, including frame body, door panel, side panel, installation accessories and packaging.	Set	2 x 4				
1.5	Supply of Control and Current combining cabinet, including low-voltage power distribution unit, UPS, DC circuit breaker, bus bar, wiring, cabinet, etc. and packaging.	Set	2 x 4				
1.6	Supply of DC cables and accessories, including inner cluster and cluster to bus cabinet cable and accessories.	Set	2 x 4				
1.7	Supply of Battery Container, Standard 20 feet Container, IP 65 or higher, RAL7035, outdoor type or available size as per the site condition	Set	2 x 4				
1.8	Supply of Temperature control system, liquid cooling units, pipes and coolants.	Set	2 x 4				
1.9	Supply of Fire protection system, Perfluorohexanone and Water spray system	Set	2 x 4				
1.10	Supply of Video surveillance system, including infrared camera, switch etc. The video surveillance system shall consist of industrial-grade IP cameras with minimum 1080p resolution, built-in infrared illumination, PoE power (IEEE 802.3af/at), and IP54 or higher protection. Cameras shall be rated for 24/7 continuous operation in enclosed electrical environments as per manufacturer datasheet. An industrial-grade managed PoE switch shall be supplied.	Set	2 x 4				
2	**Power Conversion System (PCS) Container, integrated with Medium Voltage (11kV) System**						
2.1	Supply of Containerized solution with PCS and bi-directional transformers, outdoor type, IP65 or better, Color RAL7035, Standard 40 feet container or available size as per the site condition.	Set	1 x 4				

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Line-Item No.	Description of Item	Unit	Quantity	Unit Price EXW (Foreign Currency or Taka)	Total EXW Price (Foreign Currency or Taka)	Sales Tax (Foreign Currency or Taka)	Total Price (Foreign Currency or Taka)
1	2	3	4	5	6 = 4 x 5	7	8 = 6 + 7
2.2	Supply of Power Conversion System (PCS)-Bidirectional Power Conversion System. Grid-forming mode.	Set	1 x 4				
2.3	Supply of Bi-directional Transformer: MV Transformer- Step Up/Step Down Transformer, 6.25 MVA, 11kV/ 0.69KV AC and vice versa, DYn11, Tap changer +/- 5 %.	Set	1 x 4				
3	**Supply of Energy Management System (EMS) with complete solution for integration with existing substation and BESS.**	Set	1 x 4				
4	**Supply of 1500V DC, 690V AC & Communication cable as per requirements to complete the Installation work.**	Set	1 x 4				
5	**11KV Cables and OFC Cables**						
5.1	Supply of 11kV 3-phase 185 mm², XLPE, Cu AC cable and OFC (Optic Fiber Cable) including their joints, earthing system, bonding etc. with all accessors required to complete the work (BESS output to Switchgear Panel inside the control room) and wherever required.	Lot	1 x 4				
5.2	Supply of Termination of 11kV 3-phase 185mm², XLPE Cu AC cable and OFC cable from BESS output to new switchgear panel inside control room with all accessories to complete the work and wherever required.	Lot	1 x 4				
6	**Extension of existing 11kV Busbar**						
6.1	Supply of 11kV Bus bar which shall be extended either side of existing panels to accommodate new bus section switchgear panel with/or without bus raiser, new BESS switchgear panel and 2 nos outgoing feeder panels, incoming panel wherever required after rearrangements of busbar components, similar/compatible with existing switchgear panel as per SLD. Should be Similar/Compatible with existing 11kV switchgear panels for integration.	Lot	1 x 4				
7	**Supply of new 11kV Air Insulated Switchgear (AIS) Bus Section panel with/or without bus raiser**						
7.1	Supply of new 11kV Air Insulated Switchgear (AIS) Bus Section panel with/or without bus raiser, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables , OFC cable including all associated electrical/mechanical equipment with necessary wiring/ cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear panels for integration	No	1 x 4				

Line-Item No.	Description of Item	Unit	Quantity	Unit Price EXW (Foreign Currency or Taka)	Total EXW Price (Foreign Currency or Taka)	Sales Tax (Foreign Currency or Taka)	Total Price (Foreign Currency or Taka)
1	2	3	4	5	6 = 4 x 5	7	8 = 6 + 7
8	**Supply of new 11kV Air Insulated Switchgear (AIS) Outgoing Panel for BESS Connection**						
8.1	Supply of new 11kV Air Insulated Switchgear (AIS) Outgoing Panel for BESS connection, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables, OFC cable including all associated electrical/mechanical equipment with necessary wiring/ cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear panels for integration.	No	1 x 4				
9	**LV AC cables/ DC Cables/ Control Wiring**						
9.1	Supply of LV AC and DC Cables, Battery and Battery Chargers, Light and Lighting Protection equipment, Earthing system, ACDB, DCDB, SCADA, Equipment, RTUs, Control Cables etc. as per requirement to complete the work in new and existing switchgear panels and continuation with existing control wiring and wherever required. should be Similar/Compatible with existing switchgear panels for integration.	Lot	1 x 4				
10	**11kV Cable Terminations**						
10.1	Supply of 11kV cable terminations and jointing kits complete with all associated electrical equipment in new and existing switchgear Panels and wherever required. (Extra One incomer rearrangement in Trishal)	Set	2x4 +1x1 (Trishal)				
11	**Auxiliary Supply for BESS System**						
11.1	Supply of a complete auxiliary power system to ensure uninterrupted and reliable operation of the BESS under all operating conditions, including normal grid-connected operation and Critical Load Backup (CLB) to designated feeders during grid outages. This shall include, but not be limited to, suitable transformers and all associated equipment required to power auxiliary loads such as PCS units, battery enclosures, control systems, HVAC, lighting, safety, and protection systems. All components necessary to meet the functional, safety, and performance requirements of the PSA and applicable standards shall be provided, regardless of whether explicitly mentioned. No omission of any essential auxiliary provision will be accepted.	No	1 x 4				
12	**SCADA Workstation & Software and modification**						

Line-Item No.	Description of Item	Unit	Quantity	Unit Price EXW (Foreign Currency or Taka)	Total EXW Price (Foreign Currency or Taka)	Sales Tax (Foreign Currency or Taka)	Total Price (Foreign Currency or Taka)
1	2	3	4	5	6 = 4 x 5	7	8 = 6 + 7
12.1	Supply of SCADA system for Real time monitoring and control. which shall incorporate the existing substation's components for complete monitoring and control of the entire Substation & BESS system and Integration with power grid system	Set	1 x 4				
13	**Earthing System**						
13.1	Supply of Earthing system including grounding cables and accessories based on IEEE 80-2013. Chemical/plate/rod earthing for battery and encloser, PCS, transformers, lightning protection etc. wherever and whatever required to get earthing resistance less than 0.5 ohm.	Lot	1 x 4				
14	**Fire Fighting System**						
14.1	Supply of Fire Fighting system. Should comply with NFPA-855 requirements or any other relevant requirements.	Lot	1 x 4				
15	**Miscellaneous Requirement**						
15.1	Office Rooms, (1 nos. executive table, 1 nos. Revolving chair, 4 nos. visiting chair, 1 nos. file cabinet, 1 set computer table and as required) as per approved design & drawing and instruction of Engineer-in charge /Employer.	Lot	1 x 4				
15.2	Supply of Air Conditioning System (each 2.5 Ton) for Control Room including all accessories/ components required for fitting & fixing up to commissioning as per approved design & drawing and instruction of Engineer-in-charge /Employer.	Lot	1 x 4				
15.3	CCTV System with 06 IP Cameras suitable for place and necessary accessories required for fitting & fixing up to commissioning.	Lot	1 x 4				
15.4	Desktop Computer including all accessories/components (Monitor, CPU, Printer, UPS and etc.) as per approved design & drawing and instruction of Engineer-in-charge /Employer.	No	1 x 4				
15.5	Laptop Computer including all accessories/components	No	1 x 4				
16	**Any other Miscellaneous requirements**						
16.1	Any other items(s) considered necessary to comply with the scope of Works for completing the works.	L/S	1 x 4				
	Sub-Total Schedule No. 2 =						
TOTAL Column 5 to be carried forward to Schedule No. 5. Grand Summary							

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

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Schedule No. 3 - Design Services

Item	Description of Item	Unit	Quantity	Unit Price		Total Price	
				Local Currency Portion (BDT)	Foreign Currency Portion (USD)	Local Currency Portion (BDT)	Foreign Currency Portion (USD)
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
1.0	All design, drawings and documentation works related to this assignment including 5 (Five) sets of As-Built drawings showing locations (with soft copy of as-built drawing i.e AutoCAD, GIS, PDF format etc.) and operation & maintenance manual.	set	1 x 4				
TOTAL of Column 7 and 8 to be carried forward to Schedule No. 5. Grand Summary							

[1] *Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies*

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

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Schedule No. 4- Installation and Other Services

Item	Description	Unit	Quantity	Unit Price	Total Price
				Local Currency Portion	Local Currency Portion
1	2	3	4	5	6 = 4 x 5
1	**Electrical**				
1.1	Installation, Testing and Commissioning of BESS (not including civil works) along with inside available switchyards space of existing 33/11kV substation on RCC Civil PAD.	lot	1 x 4		
1.2	Installation, Testing and Commissioning of new 11kV Air Insulated Switchgear (AIS) Bus Section panel with/or without bus raiser, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables , OFC cable including all associated electrical/mechanical equipment with necessary wiring/cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear Bus panels for integration	lot	1 x 4		
1.3	Installation, Testing and Commissioning of new 11kV Air Insulated Switchgear (AIS) Outgoing feeder panel, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/Relays/RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables, OFC cable including all associated electrical/mechanical equipment with necessary wiring/ cabling etc. as required to complete the works. Should be Similar/ Compatible with existing 11kV switchgear Bus panels for integration	lot	1 x 4		
1.4	Shifting/Rearrangement/demolition/Transposition, Installation, Testing and Commissioning of existing 11kV Air Insulated Switchgear (AIS) panels, including 11kV incoming switchgear panel wherever required, complete with all associated electrical equipment and cabling, CT, PT, Protection and Measuring equipment, SCADA equipment including IED/ Relays/ RTU, Battery and Battery Chargers, Lighting and Lighting Protection equipment, Earthing system, Ventilation, DC Cables, Control cables, Low Voltage AC cables , OFC cable and any other equipment as required to complete the works inside the existing control room with necessary modification/retrofit /demolition/reconstruction etc. with civil works. Should be Similar/ Compatible with existing 11kV switchgear panels for integration. (Extra One incomer rearrangement in Trishal)	lot	2x4 +1x1 (Trishal)		

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Item	Description	Unit	Quantity	Unit Price	Total Price
				Local Currency Portion	Local Currency Portion
1	2	3	4	5	6 = 4 x 5
1.5	Installation, Testing and Commissioning of 11kV cable terminations and jointing kits complete with all associated electrical equipment in new and existing switchgear Panels and wherever required. (Extra One incomer rearrangement in Trishal)	set	2x4 +1x1 (Trishal)		
1.6	Installation, Testing and Commissioning of 11kV Bus bar which shall be extended either side of existing panels to accommodate new bus section switchgear panel with/or without bus raiser, new BESS switchgear panel and 2 nos outgoing feeder panels, incoming panel wherever required after rearrangements of busbar components, similar/compatible with existing switchgear panel as per SLD. Should be Similar/Compatible with existing 11kV switchgear panels for integration	lot	1 x 4		
1.7	Installation, Testing and Commissioning of LV AC and DC Cables, Battery and Battery Chargers, Light and Lighting Protection equipment, Earthing system, ACDB, DCDB, SCADA, Equipment, RTUs, Control Cables etc. as per requirement to complete the work in new and existing switchgear panels and continuation with existing control wiring and wherever required. Should be Similar/Compatible with existing switchgear panels for integration.	lot	1 x 4		
1.8	Installation, Testing and Commissioning of Earthing system including grounding cables and accessories based on IEEE 80-2013. Chemical/plate/rod earthing for battery and encloser, PCS, transformers, lightning protection etc. wherever and whatever required to get earthing resistance less than 0.5 ohm.	lot	1 x 4		
1.9	Installation, Testing and Commissioning of Real time monitoring and control. The proposed SCADA system shall incorporate the existing substation's components for complete monitoring and control of the entire Substation & BESS system and Integration with power grid system	set	1 x 4		
1.10	Installation, Testing and Commissioning of a complete auxiliary power system to ensure uninterrupted and reliable operation of the BESS under all operating conditions, including normal grid-connected operation and Critical Load Backup (CLB) to designated feeders during grid outages. This shall include, but not be limited to, suitable transformers and all associated equipment required to power auxiliary loads such as PCS units, battery enclosures, control systems, HVAC, lighting, safety, and protection systems. All components necessary to meet the functional, safety, and performance requirements of the PSA and applicable standards shall be provided, regardless of whether explicitly mentioned. No omission of any essential auxiliary provision will be accepted.	Nos	1 x 4		
1.11	Installation, Testing and Commissioning of Fire Fighting system. Should comply with NFPA-855 requirements or any other relevant requirements.	lot	1 x 4		

Item	Description	Unit	Quantity	Unit Price	Total Price
				Local Currency Portion	Local Currency Portion
1	2	3	4	5	6 = 4 x 5
1.12	Installation, Testing and Commissioning of all BESS yard electrical installations including installation of Sub-station Earthing System and installation of Sub-station Lighting (as required)., installation all equipment, steel structure, cable and others as required	lot	1 x 4		
1.13	Installation, Testing and Commissioning of 11kV 3-phase 185 mm², XLPE Cu AC cable and OFC cable laying (Open cut and Backfilling) including their joints, earthing system, bonding etc. with all accessories required to complete the work (BESS output to Switchgear Panel inside the control room) and wherever required.	lot	1 x 4		
2	**Civil Works**				
2.1	Site Development/Improvement for whole BESS area including approach road if required by carted earth or dredged sand, sandy silt carried by head or truck or any other means including cost of cutting or by dredging of sand, sandy silt, all; including local carrying, placing the earth/sand, sandy silt in the designated area, maintain slopes, breaking lumps, levelling and dressing in layers up to finish level etc. all complete as per direction and accepted by the Engineer in charge.	Lot	1x4		
	Necessary dismantling, floor cut/ hole and modifications as per requirement for new and existing switchgear panels inside the control room to retrofit/accommodate/install BESS new panel, new bus section panel with/or without bus raiser, incoming panel wherever required, Rearranged feeder panels and Terminations of 11kV cables from bottom of the floor slab without any adverse effects on column and beam of existing control room building following BNBC. Should be Similar/ Compatible with existing 11kV switchgear panels for integration.				
	Mechanical compaction of above carted earth or dredged sand, sandy silt required for pre-approved specific engineering purpose in 150 mm layers including levelling, watering and consolidation each layer all complete as per direction and accepted by the Engineer -in charge.				
2.2	Supply materials and Construction of Foundation of all Equipment and structures as per approved design & drawing including necessary tests and instruction of Engineer-in-charge /Employer	Lot	1 x 4		
2.3	Supply materials and construction of surface drain if required, RCC Box or Pipe Culvert (As required) as per approved design and drawing and direction of the Engineer in charge.	Lot	1 x 4		
3	**Technical Training, Support Services (O & M) & others**				

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Item	Description	Unit	Quantity	Unit Price	Total Price
				Local Currency Portion	Local Currency Portion
1	2	3	4	5	6 = 4 x 5
3.1	Technical Training for 7 days for 20 Nos. of BREB/PBS Personnel per BESS on operation, maintenance, protection & control of 5MW,10MWh BESS (5 officials/Batch). Professional O&M team are required to do daily/regular/ special situation operation, maintenance and inspection of all equipment in the station and all training offered to client's staff to adequate/accentuate with BESS system for competency in operation and maintenance	Batch	1 x 4		
3.2	(a) Foreign Technical Training for 7 days for BREB/PBS /Nominated official 12 officials on operation, maintenance, protection & control of 4 Nos. of 5MW,10MWh BESS. (3 officials/Batch).	Batch	1 x 4		
	(b) Factory Acceptance Test (FAT)/Pre Shipment Inspection (PSI) for 7 days for BREB/PBS /Nominated official of 12 officials for the requirement of the equipment of 4 Nos. of 5MW,10MWh BESS.as per instruction of the employers/ engineering - in – charge. (3 officials/Batch).	Batch	1 x 4		
3.3	**Environmental (ESMF Related) Works**				
	Provide and maintain standard First Aid Boxes and personal protective equipment (PPE) for all workers, ensuring proper use. Supply safe drinking water and, where required, labor accommodation with adequate sanitation, hygiene, and cleanliness. Conduct regular site cleaning, dust control, and proper management of solid and organic waste, prohibiting open burning and unauthorized dumping, with disposal only at approved locations. Install temporary fencing, warning signs, and safety notices, and maintain site leveling to prevent waterlogging, erosion, and environmental nuisance, while storing construction materials safely to avoid spillage or contamination. Implement dust and air pollution control measures, including covering materials and water spraying, and conduct ambient air and dust testing at least every six months, submitting reports to the Engineer/Client. Determine groundwater depth at a minimum of two locations before major construction, and ensure drinking water quality through six-monthly testing with submitted reports. Store fuel, oil, chemicals, and hazardous materials on hard, non-absorbent surfaces with containment, immediately control spills, and carry out soil or water contamination tests every six months or after any spill, reporting results to the Engineer/Client. Maintain emergency response procedures for fire, chemical spills, or other accidents, and promptly inform the Engineer/Client with details of corrective actions taken.	lot	1 x 4		
3.4	Operation & Maintenance (O & M) support services for 5 years during warranty period. The contractor shall provide transportation facility (motorized vehicle) including driver, fuel, maintenance etc. for this support service for 24 hours during this plant DLP period.	Lot	1 x 4		
4	**Miscellaneous**				

Item	Description	Unit	Quantity	Unit Price	Total Price
				Local Currency Portion	Local Currency Portion
1	2	3	4	5	6 = 4 x 5
4.1	Completion of Power Supply Works of Electrification Acceptance Test, Integrated Tests (IT) for whole system and commissioning of complete Power Supply System and BESS as per International IEC/IEEE requirements, National Power Supply Authority (PSA) guidelines, Licensing Authority requirements, Safety Certification, Attendance and Manning during integrated Testing and Commissioning along with any materials, equipment and consumables.	Lot	1 x 4		
4.2	Installation of Air Conditioning System, Water Pump Motor Set, Overhead Water Tank, Fire Detection & Protection Facilities with all accessories/components required for fitting & fixing up to commissioning for Control Room and also installation of CCTV system with necessary accessories as required up to commissioning.	Lot	1 x 4		
TOTAL Columns 6 to be carried forward to Schedule No. 5. Grand Summary					

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

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Schedule No. 5 - Grand Summary

Schedule No.	Title	Total Price	
		Foreign Currency	Local Currency
1	Plant and Mandatory Spare Parts Supplied from Abroad		
2	Plant and Mandatory Spare Parts Supplied from Within the Procuring Entity's Country		
3	Design Services		
4	Installation and Other Services		
GRAND TOTAL to be carried forward to Form PG5A-1b			

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies
2. Create additional columns for up to a maximum of 3 Foreign Currencies if so required
3. Inclusive of all taxes

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorised to sign the Tender for and on behalf of the Tenderer		

Schedule No. 6 - Recommended Spare Parts

Item	Description	Unit	Qty	Unit Price		Total Price	
				EXW Local Parts Local Currency	CIP Imported Parts Foreign Currency	Local Currency Portion	Foreign Currency Portion
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
1	LFP Battery Cell	Nos	10,000				
2	Cable Jointing /Termination Kit	Lot	1				
3	Cooling Systems	Lot	1				
4	Control Cables	Lot	1				
5	Exhaust Fan	Nos	12				
6	Monitoring Systems	Lot	1				
7	Fire Fighting Systems	Lot	1				
8	PCS & Power Electronics	Lot	1				
9	Protection & Auxiliaries	Lot	1				
	TOTAL						

(must be filled)

Note: 1. Specify currencies in accordance with ITT 27. Create and use as many columns for Unit Price and Total Price as there are currencies

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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Phase 2: O&M Contract: (Awardable at the Employer's Discretion)
Operation & Maintenance (O&M) Service for the Battery Energy Storage System (BESS) Covering Years 6–12 for Dhaka-1, Mymensingh-2, Kishoreganj, and Narsingdi-1 PBS, Each with a Usable Energy Capacity of 5 MW / 10 MWh.

Schedule No. 7 Operation & Maintenance Service

Item	Description	Unit	Quantity	Unit Price (Local Currency) BDT	Total Price
1.0	**Operation & Maintenance (For years 6-12)**				
	Operation & Maintenance of the Battery Energy Storage System (BESS) for the Year ,including 24/7 operation support and SCADA/EMS monitoring; routine, preventive, predictive, and corrective maintenance, including battery checks such as State of Health (SoH), Depth of Discharge (DoD), and other system inspections; system performance monitoring and degradation tracking to ensure ≥98% availability; troubleshooting; software and firmware updates for BMS, PCS, and EMS; supply, storage, and replacement of consumables and specified spare parts; inspection and compliance of fire protection systems; adherence to national grid codes, safety, and environmental regulations; training of BREB/PBS personnel; preparation and submission of monthly and ad-hoc operational, maintenance, performance, and incident reports; and provision of documentation and audit support to the Employer; all in accordance with OEM recommendations, Technical Specifications, and Contract Documents.				
1.1	**Year 6: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
1.2	**Year 7: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
1.3	**Year 8: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
1.4	**Year 9: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
1.5	**Year 10: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
1.6	**Year 11: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		

Item	Description	Unit	Quantity	Unit Price (Local Currency) BDT	Total Price
1.7	**Year 6: Operation & Maintenance** (including, but not limited to, the above-mentioned activities/services)	site	4		
	Schedule 7: Total (O&M: Year 6-12)				

(must be filled)

Note: 1. Inclusive all Taxes;

1. *Create and use as many columns for Unit Price and Total Price as there are currencies*

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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Schedule No. 8 - Grand Total (Phase 1 & 2)

Schedule No.	Title	Total Price	
		Foreign Currency	Local Currency
5	Grand Summary (from Schedule 5)		
6	Recommended Spare Parts (from Schedule 6)		
7	Total (O&M: Year 6-12) (from Schedule 7)		
8	**Grand Total**		

(must be filled)

Note: 1. Create and use as many columns for Unit Price and Total Price as there are currencies
2. Inclusive of all taxes

Name:	*[insert full name of signatory]*	*Signature with Date and Seal*
In the capacity of:	*[insert designation of signatory]*	*[Sign]*
Duly authorized to sign the Tender for and on behalf of the Tenderer		

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Bangladesh Rural Electrification Board