

## Annexure-2

**Standard Operating Procedure (SoP) for connectivity and before First Time Charging (FTC) of Battery Energy Storage System(BESS) installed along with already commissioned/to be commissioned RE Projects under Rajasthan Integrated Clean Energy Policy 2024 under captive and other categories**

BESS shall consist of:

- i) A power conversion system (PCS)
- ii) An energy storage
- iii) Battery Management System (BMS)

Basic components of BESS as follows:

- i) Batteries as its underlying storage technology to be connected to an electrical network
- ii) Bidirectional inverter is the main device that converts power between the AC line voltage and the DC battery terminals, and allows for power to flow both ways to charge and discharge the battery
- iii) Other components of a BESS may include an isolation transformer, protection devices (e.g. circuit breakers), cooling systems, and a high-level control system to coordinate the operation of all components in the system

### **Documents and data to be submitted for integration of BESS:**

1. The applicant shall furnish the undertaking to comply with CEA Technical Standards for connectivity to the Grid Regulations. The following information also need to be provided alongwith the application:

S.No.	Description	Details to be furnished
<b>A</b>	<b>Battery</b>	
1	Make/Manufacturer	
2	Type / Chemistry	
3	Design capacity of battery in terms of KWh	
4	Self-Discharge rate	
5	DoD	
6	Life cycle of battery	
7	Round trip efficiency	
8	Dimensions and weight of battery	
9	Test certificate available for battery cell/module (IEC Standards	

10	Number of series & parallel connected cells and modules	
11	Power/energy rating cells and modules	
12	BESS favorable operating temperature	
<b>B</b>	<b>Power Conditioning Unit</b>	
1	Make/manufacturer	
2	Type of charge controller(DC-DC converter)	
3	Inverter- power rating & efficiency	
4	Inverter minimum response time	
5	Test certificate available (IEC Standards)	
<b>C</b>	<b>Measurement and control Devices</b>	
1	Sensors	
2	Sensitivity Type/Make	
3	Accuracy/Precision	

Battery Static Parameters:

Details	Technical requirement
<b>AC ratings</b>	
Total rated output power to load @ nominal voltage (charge) MW to (discharge) MW	
Apparent power @ nominal voltage	
No of units	
Rate output power of each unit	
Real and reactive power control accuracy( %)	
Voltage range	
Type of output	
Frequency ( Nominal Frequency and the tolerance band)	
VAR production ( full MVAR production at rated Voltage)	
Harmonics ( as per CEA standards)	
<b>DC input ratings</b>	
Voltage range	
Ripple voltage	
Ripple current (% of full current peak to Peak)	
<b>Environmental ratings</b>	
Operating temperature	
Humidity	
<b>Functions/Features</b>	