ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT NO. 4, CHUNUKOLI,
SAILESHREE VIHAR, BHUBANESWAR-751021
****

Present: Shri U. N. Behera, Chairperson
Shri S. K. Parhi, Member

Case No. 16/2019

M/s. Green Energy Development Corporation of Odisha Ltd ……. Petitioner
Vrs.
OREDA & others ……..... Respondents

In the matter of : An application u/S.86 (1) (e), 181 of the Electricity Act, 203 read with Regulation, 76 of the OERC (Conduct of Business) Regulations, 2004 seeking formulation of Regulatory framework for gross metering based solar PV roof top projects.

For Petitioner: Shri Sanjib Kumar Tripathy, Director, GEDCOL, Shri Abhisek Kaustabh and Shri Ajoy Nanda, ARE, GEDCOL

For Respondent**:** Shri Biswaranjan Mishra GM, OPTCL
Ms. S Pattanayak, Dy. Manager, Dept. of Energy, GoO
Shri S.S. Nayak, CGM, PP, GRIDCO Ltd., Ms. S Mohapatra, DM (RE), GRIDCO Ltd.,
Shri R. P. Mohapatra for self and Baitarani Green Energy Ltd.,
Shri A. K. Choudhury, DD, OREDA
Shri D M Patra, DGM, OHPC,
Ms. Sujata Das, Prog. Asst. OREDA,

Nobody is present on behalf of OPGC Ltd., SLDC, CESU, M/s. Power Tech. Consultants and Ms. Shalivahana Ltd.

ORDER

Date of hearing: 09.07.2019 **Date of order:17.12.2019**

1. The present petition has been filed by the Petitioner M/s. Green Energy Development Corporation of Odisha Ltd (GEDCOL) seeking issuance of regulatory order for Gross Metered Rooftop Solar Projects in the state of Odisha.

2. The Petitioner is a company incorporated under the Companies Act, 1956. Through a notification dated 15.03.2013, the Energy Department, Government of Odisha ("GoO") formed the Petitioner as a 100% subsidiary company of Odisha Hydro Power Corporation Limited. The Petitioner is the nodal agency for developing green energy in Odisha by facilitating investment in renewable energy projects and various green energy

sources and by developing and executing special renewable energy projects on a commercial or demonstration basis. Under Odisha Renewable Energy Policy, 2016, the Petitioner is mandated to implement solar power projects of 1 MW and above capacity in the State of Odisha. The Petitioner has facilitated implementation of net-metering based rooftop solar PPP projects of capacity 4 MWp, on government buildings, in the cities of Bhubaneswar and Cuttack.

3. As the nodal agency, the Petitioner intends to develop gross metering based grid connected solar PV rooftop projects ("Project") under the Public Private Partnership (PPP) model across the following seventeen (17) cities in Odisha.

1. Sambalpur	9. Bhadrak
2. Hirakud	10. Puri
3. Burla	11. Khurda
4. Rourkela	12. Koraput
5. Chatrapur	13. Nabarangpur
6. Balasore	14. Sunabeda
7. Berhampur	15. Jeypore
8. Baripada	16. Balangir
	17. Bhubaneswar

4. The Project would involve the selection of private developer(s) through a competitive bidding process, who will install and operate grid connected solar PV panels on rooftops of buildings owned by the state government. The project developer will sell the solar power generated to GRIDCO and assist the distribution utilities to meet their solar RPO targets. The rooftop solar systems to be installed as a part of the Project across different locations shall be connected to respective distribution network.

5. The Commission in their order dated 19.08.2016 as amended up to 17.01.2018 notified "Net Metering Order" to provide the framework for, as also the role, function and inter se obligations of the entities involved in developing solar power generating systems on the rooftops ("rooftop solar systems") on a net metering basis. The Net Metering Order also specifies the interconnection arrangements, technical standards and LT connectivity for rooftop solar projects under the net-metering arrangement.

6. The Commission vide its order dated 16.02.2019 on Suo-Motu proceeding for finalization of tariff of Renewable Energy Sources including Co-generation for the third control period 2018-19 to 2020-21 (Clause 15) has referred to GEDCOL's submission on interconnection point of rooftop solar projects under the gross metering arrangement and asked GEDCOL to approach the Commission with their request separately.

7. The petitioner sought clarity on the applicability of interconnection and LT connectivity for the proposed Project to enable the GoO and the GEDCOL to move forward with the PPP Project to be implemented across 17 identified cities which will also pave the way for other similar projects in the state of Odisha.

The following key issues in this regard have been highlighted for consideration of the Commission:

8. **Interconnection arrangements**: The connection voltage level for power injection in distribution network will vary based on the installed capacity of rooftop solar on specific premises. The interconnection arrangement has to cover aspects related to capacity limits for rooftop solar systems to connect at a particular voltage level.

The Net Metering Order provides clarity on the interconnection arrangements for net-metering based rooftop solar projects:

"7. *Interconnection arrangements: Net-metering/bi-directional metering facility shall be extended to the solar power system installed in consumer premises. These consumers are the "eligible consumers" for the purpose of net-metering/ bidirectional metering. Interconnection framework for net-metering shall address parameters including connecting voltage level, minimum technical standards for interconnection as would be indicated by the Commission from time to time under relevant regulations and orders including Orissa Electricity Regulatory Commission Distribution (Conditions of Supply) Code, 2004 and amendments thereto and as per technical standards for Connectivity of Distributed Generation resources Regulations 2013 and amendments thereto notified by Central Electricity Authority. The export from and import to the system shall be at same voltage ……..."*

9. The OERC (Procurement of Energy from Renewable Sources and its Compliance) Regulations, 2015 at Regulation 10 provides mechanism of connectivity of RE sources plant with the GRID in the following manner:

10.4 Roof-top Solar PV sources shall be allowed connectivity at LV or MV or at 11 KV of the distribution system of the licensee as considered technically and financially suitable by the licensee and the developer:

Provided that the Commission shall time to time issue specific order on such connections and commercial arrangement:

Provided further that if any dispute arises about connectivity of such sources with the grid, the matter shall be referred to the Commission whose decision in this regard shall be final.

10. The OERC Order, in the matter of suo-motu proceeding for finalization of Generic Tariff of Renewable Energy Sources including Co-generation for the Second Control Period from 2013-14 to 2017-18, provides the following provisions related to interconnection point:

"28. 'Inter-connection Point' shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case maybe.

The interconnection point for different voltage level shall be as follows:

For Rooftop based Solar installations up to 100 KW projects, the point of interconnection should be at 230 volts/400 volts of DISCOM network.

For all renewable generations of more than 100 KW and less than 5 MW projects the point of interconnection should be at 11 KV of 33/11 Kv sub-station of DISCOM network.

..... The project developer may construct the dedicated line up to the nearest point of DISCOM or OPTCL network as the case may be and such line would be treated as deemed transmission line or deemed distribution line …….

... ... The metering should be at both ends of generation and Licensee side. The billing point shall be the meter at the Generating Bus Bar .... "

In Odisha, as per the OERC Distribution (Conditions of Supply) Code, 2004 ("OERC Supply Code"):

"76. The voltage of supply shall be determined by the engineer depending on the contract demand of the consumer. The supply voltage for the contract demands shall normally be as follows:

(1) (a) For contract demand not exceeding 5 KW or 5.55 KVA, excepting in the case of irrigation pumps and agricultural services, supply shall be at single phase, two wires and 230 volts;

(b) For irrigation pumping and agricultural service load of 3 BHP and below, supply shall be at single phase, two wire and 230 volts, between phase and neutral, or 3 phase, 3 or 4 wire and 400 volts between phases;

(c) For load above 5 KW or 5.55 KVA up to and including 70 KVA, supply shall be at 2 phase, 3 wires or 3 phases, 3 or 4 wires at 400 volts between phases.

(2) For contract demand above 70 KVA but below 555 KVA, supply shall be at 3 phase, 3 wires at 11000 volts. For contract demand of 555 KVA and above but below 1110 KVA, supply may be given at 3 phase, 3 wires at 11000 volts or 33000 volts depending on the convenience of the licensee; …….……..."

11. A review of the recent orders by different State Electricity Regulatory Commissions (SERCs) indicates that a number of SERCs have defined the interconnection framework for gross metered rooftop solar projects also, as shown in the table below:

State (Order Ref.)	Installed Capacity	Connecting voltage
Karnataka	Up to 5 kW	230 V, Single Phase
	Above 5 kW to 50 kW	400 V, Single Phase
	Above 50 kWto 1000 kW	11 kV, HT
Uttar Pradesh	Up to 5 kW	Single phase at 230 V
	5 kW and above up to 50 kW/ 63 kVA	3 Phase, 4 wire at 415 V
	Above 50 kW and up to 1 MW	3 Phase at 11 kV
Telangana	Up to 5 kW	240 V- single phase
	Above 5 kW and up to 18.65 kW	415 V-Three phase
	Above 18.65 kW and upto 75kW/kVA	415 V-Three phase
	Above 75 kWlkVA	High Tension (HT)

Gujarat	1 kW - 6 kW	230 V Single phase
	6 kW - 100kW	430 V three phase
	100 kW - 1 MW	11 kV

12. The petitioner has submitted that for this Project having gross metering based rooftop solar PV systems, the following rooftop solar installed capacity be considered for the indicated interconnection voltage levels:

Rooftop solar capacity	Interconnection voltage
Upto 5 kW	230 V, Single Phase
Above 5 k W and up to 100 k W	400 V, Three Phase
Above 100 kW and less than 5000 kW	11 kV

13. **Technical Standards and LT connectivity**: The rooftop solar power generation systems with the network of the distribution licensee would need to adhere to the technical standards for connectivity with the distribution network.

The Net Metering Order provides clarity on the technical standards for net-metering rooftop solar projects:

"13. LT Connectivity:

(a)The Technical Standards for connectivity shall be as specified in the CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013 and as amended from time to time.

(c) The important clauses related to the technical and interconnection requirements are provided below:

	Parameter	Reference	Requirement
1	Service conditions	Orissa Electricity Regulatory Commission Distribution (Conditions of Supply) Code 2004 and amendments thereof	Compliance
2	Overall Grid Standards	Central Electricity Authority (Grid Standard) regulations 2010	Compliance
3.	Equipment	BIS / IEEE /IEC	Compliance
4.	Meters	Central Electricity Authority (Installation and Operation of Meters) Regulation 2006 & Amendments thereof OERC Generic Tariff Order 2013.	Compliance
5.	Safety and Supply	Central Electricity Authority (Measures of Safety and Electricity Supply) Regulation, 2010	Compliance
6.	Harmonic Current	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519

7.	Synchronization	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Photovoltaic system must be equipped with a grid frequency synchronization device. Every time the generating station is synchronized to the electricity system. It shall not cause voltage fluctuation greater than +/- 5% at point of connection.
8.	Voltage	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The voltage-operating of window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. Beyond a clearing time of 2 second, the photovoltaic system must isolate itself from the grid.
	Flicker	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Operation of Photovoltaic system should not cause voltage flicker in excess of the limits stated in IEC61000 standards or other equivalent Indian standards, if any.
	Frequency	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side), There should be over and under frequency trip functions with a clearing time of 0.2 seconds.
	DC injection	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Photo voltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point under any operating conditions
	Power Factor	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 should operate
	Islanding and Disconnection	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The photo voltaic system in the event of fault, voltage or frequency variations must island / disconnect itself within IEC standard on stipulated period
	Overload and Overheat	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are

			restored
	Paralleling Device	IEEE 519 and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations 2013	Paralleling device of photo voltaic system shall be capable of withstanding 220% of the normal voltage at the interconnection point.

Petitioner submitted to extend the technical standards applicable for the net-metered rooftop solar projects, to the gross metered rooftop solar projects also.

14. **Connectivity Diagram:** An illustrative single line diagram for gross metered projects may be specified, similar to illustration provided for Net-metered projects by the Commission in the order dated 19th August, 2016. The petitioner has also submitted a typical connectivity diagram for consideration of the Commission.

15. **Sealing arrangement**: The Commission may consider to direct the distribution utilities to seal the meter/ metering cubicle/ metering panel only and not the ACDB Breaker Panel.

16. **Type of Meter**: The meter specifications for recording the energy injection into the grid by rooftop solar project connected to the distribution network is required.

17. **Connectivity with the GRID:** The OERC (Procurement of Energy from Renewable Sources and its Compliance) Regulations, 2015 at Regulation 10 provides mechanism of connectivity of RE sources plant with the GRID in the following manner

10.2 ... Such interconnection shall follow the grid connectivity Standards as specified in the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 or State Grid Code as the case may be. The Transmission Licensee / Distribution Licensee shall provide meters and associated facilities at interconnection point.

The petitioner has submitted for extension of the applicable regulations and standards specified by CEA for the Project.

18. The petitioner has stated that the aforesaid clarifications are in the public interest and will enable the fulfillment of statutory mandate to promote renewable energy under section 86(1)(e) of the Electricity Act, 2003 given to the SERCs.

19. Shri R. P. Mahapatra, respondent filed his reply for consideration of the Commission. He has stated that, the commission has not notified any Regulation for "Renewable Energy Sources". The various provisions relating to Renewable Energy Sources are provided in the following Regulations and Orders of the commission.

(a) OERC (Procurement of Energy from Renewable Sources and its Compliance) Regulations, 2015.

(b) Order No. OERC-Engg. 02/2010/(Vol-IV)/1131 dated 19.08.2016 as amended upto 17.01.2018 on "Net Metering & their connectivity with respect to Solar PV Projects". This is applicable for rooftop Solar PV Projects, whose capacity is limited to "the sanctioned load of the consumer"

(c) OERC Order dated 16.02.2019 in Case No. 46/2018 on Suo-Motu proceedings for finalisation of tariff of Renewable Energy sources including Co-generation for the third control period 2018-19 to 2020-21.

20. Shri Mohapatra submitted that the Commission in its Notification dated 08.09.2014 notified the OERC (Terms and Conditions for determination of Generation Tariff) Regulations, 2014. These Regulations are applicable for all existing and future Generating Stations supplying power to GRIDCO, except generating stations which are subject to the jurisdiction of the Central Commission and also renewable energy generating stations located in the State whose tariff is decided by the Commission under relevant Regulations/ orders.

21. Shri Mohapatra stated that various terms for determination of tariff have been provided in the Regulation and Orders as mentioned above. He therefore submitted that the various provisions in the existing Regulation/Orders of Renewable sources may be consolidated into a single regulation providing terms and conditions for determination of generation tariff for Renewable Energy Sources, including Co-generation. The generation tariff for Renewable Energy Sources may be determined either annually or for a Control Period of 3 to 5 years. He suggested that the submissions of GEDCOL may be considered and a Regulation be made in this regard.

22. He further stated that the OERC "Procurement of Energy from Renewable Sources and its Compliance) Regulations, 2015, has the following provisions in Para 10.3.

"10.3 The licensees shall be responsible for development of evacuation infrastructure beyond the inter-connection point while the developer/ generating company will have to develop evacuation infrastructure from generating facility upto the inter-connection point at its own expense:

Provided that in case of Renewable Energy Sources having installed capacity of less than 1 MW the developer shall provide the evacuation infrastructure upto the inter-connection point:

xxxxxxxx"

23. Shri Mohapatra further submitted that the area required for a Solar PV Project of 1 MW capacity would be between 5 to 6.5 acres depending on the technology and solar insolation. Therefore, installation of a Solar PV Project for export of power of capacity 1 MW or above is not possible on the existing rooftops. The Commission may provide for "100 KW" in place of "1 MW"

24. Respondent CESU stated that under the existing Bulk Supply Agreements with GRIDCO Ltd. (in short GRIDCO), the Distribution Utilities of Odisha are under obligation to purchase power solely from GRIDCO, as GRIDCO is the designated agency to purchase power from all generators of the state. Therefore at present as per the provision of the OERC, all the renewable power purchase obligation lies with GRIDCO considering single buyer model. If power purchase obligation regarding solar rests with the DISCOM, in that event the tariff (feed in tariff) may be determined considering the viability of DISCOM, by the commission through a hearing process.

25. He stated that if the petition is allowed for gross meter based grid connected solar PV rooftop projects under the Public Private Partnership (PPP) model across the following 17 cities in Odisha, the following may be considered by Commission.

a) The eligible consumer or third party owner as the case may be availing gross metering arrangement under these Regulations shall not be allowed to apply for net metering arrangement within the same premises or vice-versa.

b) If the eligible consumer or third party owner installs solar rooftop system under the gross metering scheme, the entire power generated from such an installation shall be injected to the distribution system of the Licensee at the interconnection point.

c) The maximum peak capacity of the grid connected rooftop solar PV system to be installed by any eligible consumer under gross metering model shall not exceed 100% of the sanctioned load /connected load/ contracted demand of the consumer.

d) The capacity of the grid connected rooftop solar PV system to be installed by any eligible consumer or third party owner under gross metering model shall not be less than 10 kWp and shall not exceed 1 MWp.

e) The joint meter reading shall be taken by GRIDCO and DlSCOM which shall form the basis of commercial settlement. Mandatory provision for installation of

AMR and ABT compatible meters for all categories of consumers may be made. The data concerning generation capacity should be remotely captured and monitored by the GRlDCO and DlSCOM at their control room on real time basis. The communication system should be installed by the eligible consumer or third party owner as the case may be and at their cost·

f) The solar billing as per gross meter data will be done by GRIDCO. If Commission considers CESU to do billing and collection then some facilitation charges shall be considered for CESU due to the following additional work to be done.

- Meter Reading of Solar Generation meters and handing over the data to GRIDCO.
- Maintaining separate account on Solar payment & CESU's dues
- Meter Installation, sealing, inspection, testing works for all the three Meters
- Calibration of Meters on year to year basis
- Replacement of defective meters (meters to be provided by the Developers)

g) There shall be a mandatory provision for installation of the check meter after the inverter of the Solar rooftop system.

h) To include the provision in the regulations for non-applicability of Gross Metering regulation to the consumer whose arrears are pending.

26. Respondent OREDA submitted that under Odisha Renewable Energy Policy, 2016 the petitioner has been mandated for implementation of solar power projects of 1 MW and above capacity in the state of Odisha which clearly means that any single project implemented by the petitioner should be of capacity 1 MW or above. But instead of exploring such projects the petitioner has engaged itself in implementing smaller projects (less than 1 MW capacity) by aggregating them to 1 MW or above capacity. This is gross violation of the mandate given under the policy and is an encroachment in to the mandate of OREDA who under the same policy are responsible for implementation of solar power projects below 1 MW capacity.

27. The prevailing net-metering/bi-directional metering order of the Commission is intended to encourage consumers to become prosumers and thereby benefit themselves by saving their electricity expenses in the higher slabs and at the same time it shall benefit the

DlSCOMs/GRIDCO by contributing to their Renewable purchase Obligation. Whereas in the gross-metering mode proposed by the petitioner though DISCOMs/GRIDCO will continue to get their RPOs fulfilled, the consumer does not get any benefit at all. The consumers will continue to purchase power at tariffs determined by the Commission from time to time which normally increase at the rate of 4% per annum. Further, use of their rooftops for installation of solar power plants might cause them several inconveniences for which there is no provision of any compensation.

28. The private developers will only benefit themselves by selling power to GRlDCO while using rooftops of government buildings absolutely free of cost. Assisting GRlDCO in fulfilling their RPOs is only incidental which otherwise would have also been accomplished under the net metering scheme.

29. In Net-metering mode the prevailing contract demand has been fixed as the upper capacity limit of the solar power plant irrespective of voltage of injection. Whereas in gross metering mode the size of the rooftop is supposed to decide the capacity of the power plant which will certainly call for variance in injection voltage level. Thus Supply of power to the building at one voltage level and injection of power to the grid from the solar power plant at another voltage level will need additional infrastructure which might cause inconveniences. However, limiting the power plant capacity to the prevailing consumption level voltage might not ensure total utilization of the rooftop capacity.

30. The clarifications sought by the petitioner are only in the interest of private developer and not in the interest of public in any manner. OREDA has therefore made the prayer not to permit implementation of rooftop projects below 1 MW capacity which has not been mandated to the petitioner under the Odisha Renewable Energy Policy 2016. The proposal for gross metering of rooftop solar power plants will singularly benefit the private developers by permitting them free use of roof tops of government buildings while jeopardizing the safety and security of the buildings and simultaneously causing several inconveniences to the users of the buildings.

31. GEDCOL gave its rejoinder on the replies of the CESU. Petitioner submitted an amended Single Line diagrams for gross metered project. The first revised Diagram shows connectivity at 230V/ 415V and the second revised Diagram shows connectivity at 11KV. The petitioner gave its analysis/ assessment of the submissions made by the respondent CESU which is placed in the following table.

Sl. No.	Comments by CESU	Analysis/Assessment	GEDCOL Submission
1.	Eligible consumer for net metering shall not be eligible for gross metering	Other state regulators such as Telangana State Electricity Commission (TSERC) under its Regulation for connectivity with the Grid and sale of electricity from the Roof-top Solar Photovoltaic System, 2015, has specified that an eligible consumer including a third party owner availing of net metering arrangement under this regulation shall not be allowed to apply for gross metering arrangement within the same premises or vice versa.	Proposed change is acceptable.
2.	Maximum capacity of the solar plant should not be 100% of contracted demand.	Restriction of capacity limits on sanctioned demand is not required. Consumer shall be restricted to go either for net metering or gross metering. Putting restriction will defeat the purpose of leveraging extra potential available on these rooftops. OERC in its Net Metering Order, with Order No.OERC-Engg.02/ 2010/ (Vol. IV)/1131 Dated 19.8.2016 as amended up to 17.1.2018 has already specified the capacity restrictions for net metering installations. Capacity to be installed under gross metering shall only be guided by the connecting voltage requirements and transformer/line capacity.	No such restriction is required. But it should not exceed the distribution transformer capacity.
3.	Capacity of solar rooftop project under gross metering shall not be less than 10 kWp and not more than 1 MWp.	OERC in its Net Metering Order, with order No. OERC-Engg. 02/ 2010 (Vol. IV) /1131 has already specified the capacity restriction for net metering installations. Capacity to be installed under gross metering shall only be guided by the connecting voltage requirements.	No such restriction is required.
4.	Joint meter reading shall be taken by GRIDCO and DISCOM. Include mandatory provision on installation of AMR & ABT meter.	OERC under its Net Metering order, with order No. OERC-Engg./02/ 2010(Vol. IV)/1131 dated 19.08.2016 specified that the meter reading, both net meter and solar generation meter shall be taken by the distribution licensee and shall form the basis for commercial settlement. Also, only MRI and AMR needs to be installed in line with the OERC net metering order.	Joint meter reading issue should be decided on mutual discussion. Provision on installation of AMR is justified and is in line with net metering regulation issued by the Commission. ABT compliant meter is not required because the

			rooftop solar projects are small in capacity.
5.	Make the mandatory provision for installation of check meter after the inverter of solar rooftop system.	OERC under its Net metering order, with order No. OERC-Engg./02/ 2010(Vol. IV)/1131 dated 19.08.2016 specified that the installation of Check meter for the solar energy system would be optional.	Installation of the check meters for gross metering applications shall also be optional and not mandatory.
6.	If the Commission considers CESU to do billing and collection, then some facilitation charges shall be considered for DISCOMs for: Meter reading of solar generation meters and handing over data to GRIDCO. Maintaining of solar payment account and CESU dues. Meter installation, sealing. Calibration of meters and replacement of defective meter.	The present transaction structure for gross metering specifies about the facilitation charge being provided to CESU for billing and collection.	Facilitation charges could be finalized in discussion with GRIDCO.

32. The petitioner, therefore, made a prayer to issue the 'Gross Metering' Regulation in the state to enable GEDCOL for implementation of 19 MW Grid-connected Roof-top solar project scheme in 17 cities of the state under PPP model and power procured by GRIDCO under 'Gross Metering' will count towards the RPO of GRIDCO.

33. The respondent GRIDCO made the following submissions:

- At present, Gross Metering framework is not in force in Odisha unlike other states such as Karnataka, Uttar Pradesh, Maharastra where they have implemented Gross Metering framework.
- Gross Metering framework with Central Financial Assistance (CFA), which will not only help in development of Roof-top solar project in the state but also increase the commissioned solar capacity in the state.
- Since the selection of the developers will be made through competitive bidding process, this will be in line with the policies and regulations applicable in the state.

- Since the selected Project Developers will sell the power generated from the 19 MW Grid-connected Roof-top solar projects to GRIDCO, through the distribution network, this will help in reducing the distribution loss level.
- As regards the 'Interconnection Arrangements', the inter-connection voltage with the distribution network may be as proposed by the Petitioner, based on the installed capacity of the Roof-top solar project, as per the OERC Distribution (Conditions of Supply) Code, 2004.
- The technical standards for L.T. connectivity with the distribution network will be as per CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013 and as amended from time to time.
- The connectivity single line diagram for the Roof-top solar power projects based on the 'Gross Metering' framework, as submitted by GEDCOL may be accepted.
- As it is proposed to connect the 19 MW Grid-connected Roof-top solar project scheme to the L T level of the distribution network, the DISCOMs may be directed for the sealing arrangement of the Meters/ Meter Cubicles/ Metering Panel.
- For the Solar Power Generators with the 'Gross Metering' framework for the 19 MW Grid-connected Roof-top solar project scheme, 0.2s Secure Make ABT Meters may be considered as in case of other solar Generators. The DISCOMs/ STU are to provide the meters with the associated facilities at the inter-connection point.

34. The Commission has gone through the petition of GEDCOL for implementation of Gross metered rooftop solar project in Odisha under the PPP model across the 17 cities of the state with the aggregate capacity of 19 MW which shall be connected to the distribution network at appropriate voltage level. The petitioner has submitted that this project would involve the selection of the private developers through a competitive bidding process, who will install and operate Grid connected solar PV panels on Rooftops of buildings owned by the State Government. The Solar power generated from these projects will be sold to GRIDCO and this will also help GRIDCO to meet their Solar RPO targets.

35. The Commission, as on today, has allowed Solar Rooftop Projects to come up in the state under the Net metering arrangement through an order dated 19.08.2016 and its subsequent amendment dt.17.01.2018. In the Net metering order, the Commission has specified the guideline for interconnection arrangements of solar rooftop projects. We had also directed GEDCOL in our order dated 16.02.2019 in Case No. 46/2018 to

approach the Commission separately for implementation of the solar projects under Gross metering arrangement.

36. The interconnection of gross metered rooftop solar project with the distribution network is the main issue in operationalization of the scheme. Since these solar rooftop projects are independent generators they must be connected with the distribution system as per the voltage level mentioned below which is commensurate with the provision of OERC Distribution (Condition of Supply) Code, 2019. In addition to that the solar rooftop generator shall adhere to CEA (Technical Standard for Connectivity of the Distributed Generation Resources) Regulations, 2013

Rooftop solar capacity	**Interconnection voltage**
Upto 5 kW or 5.55 KVA	230 V, Single Phase
Above 5 kW or 5.55 KVA up to and including 70 KVA	3 phases, 3 or 4 wires at 400 volts between phases
Above 70 KVA and less than 555KVA	3 phase, 3 wires at 11000 volts
555 KVA and above but below 1110 KVA	3 phase, 3 wires at 11000 volts or 33000 volts depending on the convenience of the licensee/ supplier

37. Respondent CESU has submitted that since the power will be procured by the GRIDCO under the gross metering arrangement the billing should be done by GRIDCO. In case the onus of billing and collection is given to CESU, they must be allowed some facilitation charges due to additional work to be done by CESU, such as meter reading, maintaining separate account on solar payments, meter installation, sealing, inspection, testing and calibration of meters and replacement of defective meters. The Commission in this regard observes that since the solar plants under the gross meter arrangement will mostly be at the interconnection voltage of 230 V, 400 V and 11 KV, the above works needs to be done by DISCOMs. They shall enter into agreement with the developer of the prospective gross metered solar projects on behalf of GRIDCO for metering, billing and payment for the power injected to the DISCOMs system. For this work DISCOMs shall get a facilitation charge mutually agreed between GRIDCO and DISCOMs.

38. The petitioner has submitted that the meter specification for recording the energy injection into the grid by rooftop solar project connected to the distribution network is required. The metering standard for connectivity into the distribution system shall be as per CEA (Installation and Operation of Meter) Regulations, 2006 and amendment thereof. It is needless to say that the connectivity of the solar generator with distribution system shall also be guided by Regulation 10 of OERC (Procurement of Energy from Renewable Sources and its Compliance) Regulations, 2015 and its subsequent

amendment which inter alia provides mechanism for development of evacuation infrastructure.

39. The Commission has taken cognizance of the concerns raised by OREDA, regarding Gross metering arrangement proposed by GEDCOL, wherein they apprehend encroachment of the mandate through this petition by GEDCOL, as given to them in the Odisha Renewable Policy 2016 of promoting and facilitating solar power plants of below 1 MW. It is to be mentioned here that as per Clause 3.3.2 Odisha Renewable Policy, 2016 OREDA shall be the Nodal Agency for the projects below 1 MW capacity on the consumers side of the meter which are basically net metered projects. Therefore, the present application of GEDCOL to develop gross metered rooftop solar project does not encroach the mandate of OREDA since the developer is not a consumer.

40. The Commission, therefore, now allows both the arrangements (Net metering and Gross metering) on the rooftop to be operative concurrently in the state and the choice of metering arrangement i.e. Net meter or Gross meter will be left to the consumer or developer. But net metered and gross metered projects cannot operate simultaneously in the same premises. It is also clarified that in no case there can be inter-connectivity of Gross Solar generation with the consumer installation, who owns the Rooftop.

41. GEDCOL is accordingly allowed to implement 19 MW Grid-connected Roof-top solar project scheme in 17 cities of the state under PPP model and power procured by GRIDCO under 'Gross Metering' will count towards the RPO of GRIDCO. The solar plant installations that are set up under the gross metering scheme shall be installed through competitive bidding process only for the selection of private developer. Any Central Financial Assistance received on this account shall be factored in to reduce the cost of procurement of power for GRIDCO. We are also approving schematic single line diagram for both the connectivity at 230 /415 V and at 11 KV for operationalization of Gross Metering of Solar rooftop, which is given in Annexure – I of this order. The Commission reserves the right to amend this order further in case any bottleneck arises out of its implementation.

42. The case is accordingly disposed of.

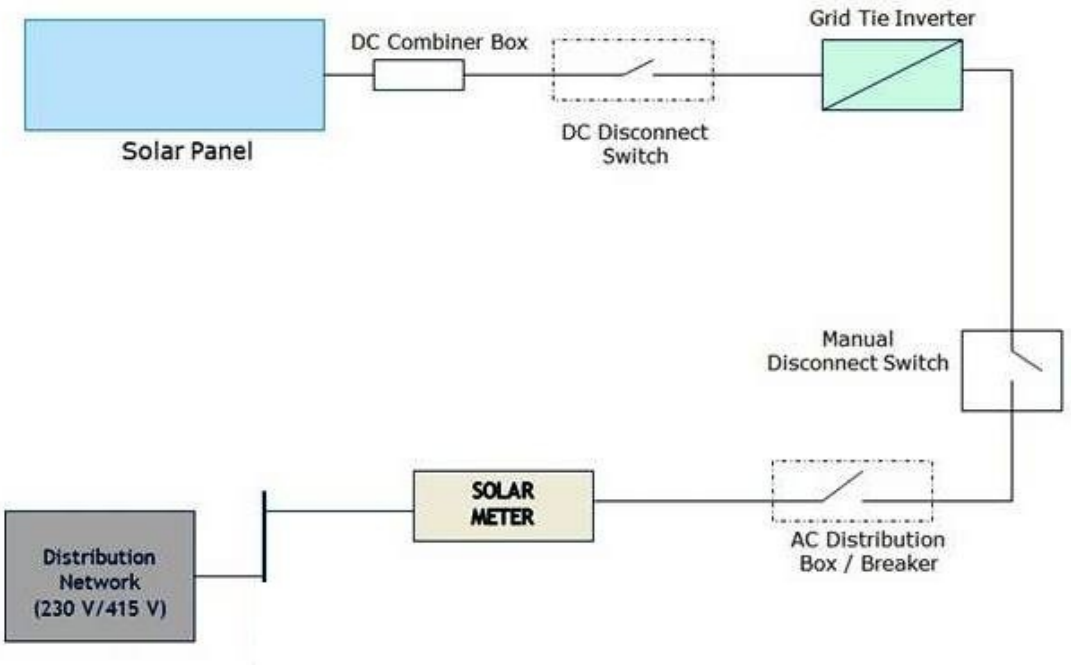
Sd/-
(S. K. Parhi)
Member

Sd/-
(U. N. Behera)
Chairperson

Annexure -I

Schematic Single Line Diagram

A) Connectivity at 230V/415V



B) Connectivity at 11 kV