

**BEFORE THE CENTRAL ELECTRICITY
REGULATORY COMMISSION,
3RD AND 4TH FLOOR, CHANDRALOK BUILDING,
JANPATH, NEW DELHI**

IN THE MATTER OF:

PETITION NO.

Petition under Section 66 of The Electricity Act, 2003 read with the Regulation 7 of the Central Electricity Regulatory Commission (Power Market) Regulations, 2010 for approval of introduction of the Green Term-Ahead Market (Renewable Energy) Contracts at Indian Energy Exchange Ltd.

AND

IN THE MATTER OF:

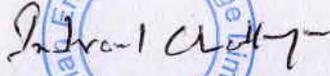
Indian Energy Exchange Limited (IEX) ----Petitioner
Fourth Floor, TDI Centre,
Plot No - 7, Jasola,
New Delhi – 110025



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For Indian Energy Exchange Limited


INDRANIL CHATTERJEE
CHIEF RISK OFFICER

At: New Delhi

Dated: 26th November, 2018



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Plot No - 7, Jasola,

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MOST RESPECTFULLY SHOWETH:

1. The Indian Energy Exchange Limited (hereinafter referred to as the "IEX" or as the "Exchange"), is a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at



4th Floor, TDI Centre, Plot No. 7, Jasola, New Delhi 110 025.

2. The Honorable Central Electricity Regulatory Commission (hereinafter referred to as "Hon'ble Commission") was pleased to grant permission to the IEX to set up, operate and commence exchange operations by its orders dated 31.8.2007 and 9.6.2008. That IEX has been in operation since 27.06.2008.
3. By way of the present Petition, the Petitioner herein seeks approval of this Hon'ble Commission to introduce Green Term- Ahead Power (Renewable Energy) Contracts on its platform.

Background:

4. It is submitted that, IEX is presently operating Day Ahead Market (DAM) and Term Ahead Market (TAM) in electricity segment and Renewable Energy Certificate (REC) and Energy Saving Certificates (ESCerts) Market in accordance with the Bye-Laws, Rules and Business Rules, Regulations and Approvals of this Honorable Commission. In particular, electricity transactions on Power Exchange are governed by Power Market Regulations and Open Access Regulations and Procedure thereof.
5. The Exchange has provided flexibility to participants by offering diversified products to trade in electricity. IEX commenced its operation by introducing Day Ahead Market (DAM) allowing participants to procure power



for the following day. Subsequently, it offered four products in the Term Ahead Market (TAM) segment, helping participants manage their power needs up to 11 days in advance to three hours before start of delivery. The Exchange is also aiding the obligated entities in accomplishing the RPO (Renewable Purchase Obligation) by providing the platform for trading of RECs (Renewable Energy Certificates).

6. Since the last ten (10) years, IEX has been successfully providing a transparent, demutualized and automated platform enabling competition, efficient price discovery and counter party risk management for its participants in DAM and TAM markets.

Need for a RE Contract:

7. India has an immense potential for growth of renewable energy sector. The country is emerging as a major market for renewable energy. It may be noted that India has increasingly adopted generation from renewable energy based projects and has taken positive steps towards reducing carbon emissions and ensuring a more sustainable future. With an ambitious target of achieving 175 GW by 2022, India has been putting in massive efforts towards cleaner energy.
8. The tariff mechanism of renewables has transitioned from FIT regime to competitive bidding regime. Earlier, the tariffs were decided by the Electricity Regulatory commission. Now, in the competitive regime we have



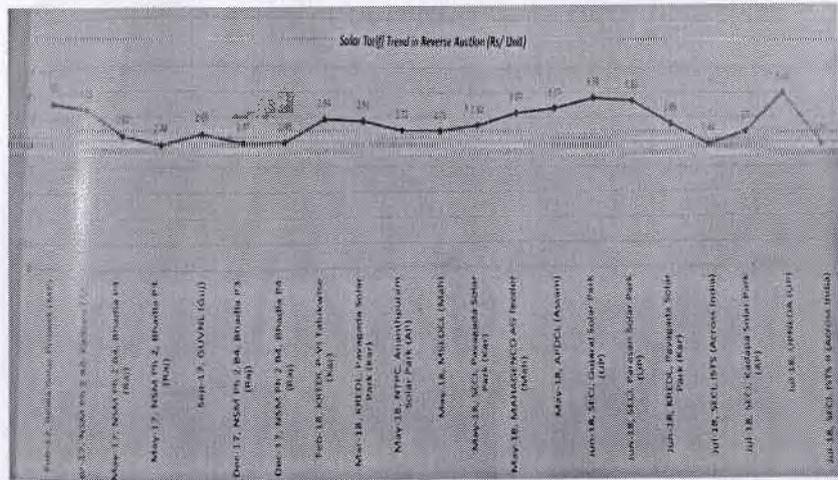
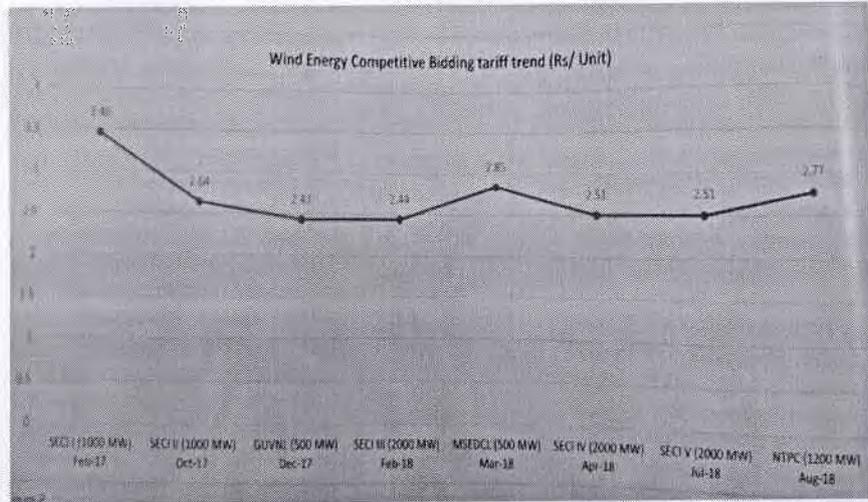
seen major fall in the price of renewable energy. We believe that by allowing competition over the power exchanges would further benefit the efficient price discovery.

9. Central Electricity Regulatory Commission (CERC) has paved way for merchant renewable power plants by issuing guidelines for long-term transmission access while prescribing stringent rules against squatting and line under-utilization. The Hon'ble Commission has issued detailed procedure for grant of long- and medium-term transmission access to renewable energy project that has acquired half of its land requirement and achieved financial closure. CERC has now put safeguards to ensure that connectivity with the grid is granted only to serious RE players who are in possession of land and have achieved financial closure. Experts have hailed the move and said that it will encourage setting up merchant renewable plants and sale of electricity in the open market, particularly at a time when spot power prices are higher at over Rs 3 per unit against tariff-based auction discovered Rs 2.4 - 2.8 per unit.

10. The graph below provides the decline in rates discovered at tariff based auctions with time. The rates have declined by more than 70% within a span of 10 months, thus strengthening the requirement of a shift from the conventional auction based model to an exchange based model particularly at a time when we find many of such



auctions did not elicit desired response from the investors.



11. The rapid advancement in technology has resulted in fast-declining costs of solar and wind energy. This holds a promise for renewable energy to turn them as the main drivers of growth in the power sector in the days to come. With advancement of technology the predictability of the supply has also increased.



12. Renewable energy has crossed a major landmark as it has started competing directly with electricity generated from thermal power plants in the spot market, thereby, intensifying competition in the sector. Renewable power companies have started to compete with coal-based plants in the spot market and they received better tariffs than those discovered in the auction process. Presently, there are 21 solar generators registered at the exchange with a total installed capacity of over 1000 MW. During the period between April-18 to August-18, the volume traded by the solar clients has been 69 MUs. This volume, although meager, establishes the fact that solar power can be scheduled even in the Day ahead market and creates a possibility of successful trading of renewable energy on the exchange platform.

The table below lists the name of solar generators registered with IEX and their installed capacity:

S. No	Solar Generators registered with IEX	Capacity (MW)
1	Wardha Solar (Maharashtra) (P) Ltd., Rastapur Shahpur, Yadgir Dist.	40
2	Wardha Solar (Maharashtra) (P) Ltd., Rajeshwar Village, Basavakalyana Taluk, Gulbarga District	40
3	Wardha Solar (Maharashtra) (P) Ltd., Madhuvanahalli, Kollegala	100
4	Wardha Solar (Maharashtra) (P) Ltd., Maskal Aurad, Bidar Dist	50



5	Wardha Solar (Maharashtra) (P) Ltd., Nalwar Village, Chitapur, Taluk, Gulbarga Dist.	50
6	Parampujya Solar Energy Pvt. Ltd. (20MW), Kallur Village, Yelburga Taluk, Koppal Dist.	17
7	Wardha Solar (Maharashtra) (P) Ltd. (10MW), Kallur Village, Yelburga Taluk, Koppal Dist.	8
8	Wardha Solar (Maharashtra) (P) Ltd., Yatnal	10
9	Freewings Power & Infra Ltd.	2.6
10	Renew Clean Energy Pvt. Ltd.	51
11	Ramesh Steels, Pachama, Ganj Basoda	4
12	ACME Babadham Solar Power Pvt. Ltd.	20
13	ACME Koppal Solar Energy Pvt. Ltd., Farhatabad Village, Kalburgi Taluk, Kalbugi Dist.	22
14	ACME Jodhpur Solar Power Pvt. Ltd.	100
15	ACME Rewa Solar Energy Pvt. Ltd.	100
16	Clean Sustainable Energy Pvt. Ltd.	60
17	SB Energy One Pvt. Ltd. L-5	100
18	SB Energy One Pvt. Ltd. (Plot-L4)	100
19	SB Energy One Pvt. Ltd. (Plot -3)	100
20	SB Energy One Pvt. Ltd. (L-1)	30
21	SB Energy One Pvt. Ltd. (Plot-2)	30
Total Installed Capacity		1034.6

13. India is on track to catalyze Rs.(14.5 lakh-21 lakh) Cr. of new investment in its renewable energy infrastructure in the next decade with global capital inflows playing an increasingly crucial role. It is now imperative to develop a market driven mechanism in order to foster higher



shares of renewables into the grid. The advantages of doing the same would be:

- a. For RE Generators, an additional option to sell their green power and the buyers have an additional avenue to fulfill their renewable purchase obligations.
- b. The market signals would eventually result in encouragement for new merchant capacity to come up.
- c. There are curtailments of RE generators in several States and such generators having surplus wind or solar power at their disposal will be able to sell the said surplus power in the market.
- d. Address the concerns of the generators regarding uncertainties around signing of long term PPAs and associated issue of recovery of cost of RE generation.
- e. RE generators may not feel the need for long term tie-up of capacities in advance or depend on the conclusion of PPAs for the purpose of project viability.
- f. Proposed product will encourage small participants like Open Access Consumers and CPP Consumers to buy green power to meet their RPO.(RPO Compliance by the means of firm power) There is also a growing trend in corporates to voluntarily commit to entire green power procurement



to meet their demand. This trend would also get strengthened by introduction of Green Electricity Contracts.

14. A market based mechanism where RE surplus and RE deficit states would trade RE power and balance their RPO targets would incentivize RE resource rich states to develop RE capacity beyond their own obligation.
15. MNRE, too, has recognized that newer opportunities must be created to provide thrust to Renewable Energy in the country. They have preferred trade of power over trade of RECs. In the report titled 'Market Design for Renewable Energy Grid Integration in India' prepared by Internationale Zusammenarbeit (GIZ) GmbH, as a part of the Indo – German Energy Programme – Green Energy Corridors, which was hosted on the MNRE website, it was recommended that to increase the share of RE to the desired level, it was imperative that a market driven mechanism should be introduced.

“Offtake of RE power is still a challenge due to its price competitiveness with conventional sources of power. RPOs, Feed in tariff, competitive bidding, tax policy and many other policy, fiscal and regulatory interventions are providing impetus to facilitate off take of RE. However, in future would such intervention



still facilitate off take of additional large shares of RE generation such solar and wind into the grid. Hence, it is imperative to develop a market driven mechanism in addition to regulatory interventions in order to foster higher shares of renewables into the grid.”

16. Moreover, MNRE in a letter to IEX expressed the need for a separate renewable power trading window. MNRE believes that by opening up a separate renewable energy trading window in exchanges will lead to enhanced visibility and will also create an organized competition out of the shadow of conventional power. General observation and interaction with various stakeholders validates the perception. The letter dated 16th April, 2018 is appended as an annexure (Annexure 1).

17. In Conference of Power and NRE Minister's of States/UTs held on 3rd July, 2018 at Shimla, Himachal Pradesh, a need to create possibility to buy renewable power through market mechanism was put forward by MNRE.

18. The introduction of contract for trade of renewable power would also aid the obligated entities to buy firm renewable power and thereby, help meet their Renewable Purchase Obligation. Ministry of Power (MoP) vide circular dated 14th June, 2018 has notified the long term growth trajectory of Renewable Purchase Obligations for



Solar as well as Non Solar, uniformly for all states/ uniform territories, for three years period from 2019-20 to 2021-22 as under.

RPO	2019-20	2020-21	2021-22
Solar	8.75%	10.75%	12.75%
Non-Solar	10.25%	10.25%	10.25%
Total	19.00%	21.00%	23.00%

19. While the states are notifying their own RPO obligation in line with national target, it is observed that the compliance level of the states is extremely low, whereas the targets are becoming exceedingly steep. Thus enabling the need for market based transaction of RE power from RE rich states to other states.

20. In comparison with increasing Renewable Purchase Obligations, it is seen that the performance of the states in terms of compliance is far from satisfactory. As per data published in the "Agenda Note for National Review Meeting of State Principal Secretaries and State Nodal Agencies of Renewable Energy", it was observed that most of states were below the level of 60% RPO compliance in the year 2015-16. The same has been given below in the table:



State-wise RPO Compliance for the year 2015-16

States/UTs	Electricity Consumed 2015-16 (MU)	RPO Solar	RPO Non-Solar	RPO Total	RPO (% Compliance)	RPO Compliance level
Andaman and Nicobar	127	1.15%	2.80%	3.95%	374.6%	Above 100%
Meghalaya	3242	0.40%	0.60%	1.00%	203.5%	
Karnataka	77605	0.25%	10.00%	10.25%	126.5%	
Nagaland	980	0.25%	7.75%	8.00%	113.2%	
Himachal Pradesh	14037	0.25%	12.00%	12.25%	111.8%	
Andhra Pradesh	60087	0.25%	4.75%	5.00%	103.4%	Between 60-100%
Tamil Nadu	103816	2.00%	9.00%	11.00%	81.7%	
Maharashtra	150571	0.50%	8.50%	9.00%	79.4%	
Rajasthan	73394	2.50%	8.90%	11.40%	78.9%	
Gujarat	105230	1.75%	8.25%	10.00%	76.1%	
Haryana	48466	1.00%	2.75%	3.75%	73.9%	
Madhya Pradesh	58890	1.00%	6.00%	7.00%	70.6%	
Chhattisgarh	23614	1.00%	6.25%	7.25%	70.2%	
Punjab	54820	0.19%	3.81%	4.00%	67.2%	
Uttarakhand	13054	0.30%	9.00%	9.30%	57.9%	
West Bengal	52607	0.25%	5.25%	5.50%	55.6%	
Lakshadweep	52	1.15%	2.80%	3.95%	50.0%	
Kerala	24769	0.25%	4.85%	5.10%	49.0%	
Mizoram	699	0.25%	8.75%	9.00%	43.9%	
Uttar Pradesh	124074	1.00%	5.00%	6.00%	43.0%	
Tripura	1502	1.15%	1.85%	3.00%	41.0%	
Telangana	50842	0.25%	4.75%	5.00%	40.4%	
Arunachal Pradesh	755	0.20%	6.80%	7.00%	34.9%	
Odisha	30231	0.30%	6.70%	7.00%	20.5%	
Puducherry	2579	1.15%	2.80%	3.95%	15.7%	
Jammu & Kashmir	23612	2.00%	7.00%	9.00%	14.3%	
Assam	9760	0.25%	6.75%	7.00%	13.3%	
Bihar	23608	1.25%	4.25%	5.50%	12.7%	
Delhi	25820	0.35%	8.65%	9.00%	5.5%	
Chandigarh	1561	1.15%	2.80%	3.95%	5.5%	
Daman & Diu	2223	1.15%	2.80%	3.95%	4.8%	
Jharkhand	21693	1.00%	3.00%	4.00%	2.3%	
Dadar & Nagar Haveli	5691	1.15%	2.80%	3.95%	0.2%	
Goa	4246	1.15%	2.80%	3.95%	0.0%	
Manipur	1125	0.25%	4.75%	5.00%	0.0%	



21. The lack of compliance from the states and corresponding deficit in RE capacities reinforces the

need to sell renewable energy through exchange at competitively delivered market prices, beyond the conventional PPA and REC framework.

22. Recently, we have seen an upsurge in the trade of RECs at the power exchanges. This is mainly due to collective efforts of MoP, MNRE, CERC, State Regulators, and other agencies involved in the implementation of RPO compliance. Here it is important to point out that the inventory of RECs is depleting rapidly. The Buy Bids for Non-Solar RECs (issued after 1st April, 2017) have exceeded the Sell Bids since March 2018.

Month	Segment	Buy Bids (RECs)	Sell Bids (RECs)
Mar-18	Non-Solar*	2,256,422	2,079,799
Apr-18	Non-Solar*	417,686	188,672
May-18	Non-Solar*	478,940	375,218
Jun-18	Non-Solar*	856,844	295,070
Jul-18	Non-Solar*	655,553	264,901
Aug-18	Non-Solar*	668,060	428,575
Sep-18	Non-Solar*	501,255	486,175
Oct-18	Non-Solar*	724,461	434,675
* Non-Solar RECs issued after 01.04.2017			

23. At this stage, when the existing instruments are less than the demand and because of historical reasons new registration by RE generators under REC mechanism has dwindled, opening new avenues for the renewable generators to sell their power has now become a glaring



need in the power market. Renewable energy generators have an immense potential to consider commercial ways to sell renewable energy through exchange beyond the conventional PPA and REC framework. Untapped RE potential can be unlocked and made available in the market on financially viable terms. Investors would be enthused to invest in RE projects with full or partial merchant capacity rather than getting dissuaded by the declining trend in tariff discovered in the Long-term PPAs. The flexibility of being available in both regulated (long-term PPAs) and open market would help him balance his risks and returns.

24. To understand the perspective of the stakeholders IEX conducted a Brainstorming Session on “Green Power Market” on 5th June, 2018 in New Delhi. One of the points of discussion in this session was to seek suggestions and comments of the stakeholders on the proposed Green Electricity Market. There was a wide-spread consensus amongst the participants who attended the seminar on the need and usefulness of the proposed Green Electricity Market. The session was attended by 18 delegates from various Renewable Generating companies. The list of the attendees and the minutes of the meeting are attached as an Annexure 2.

25. Another concern on the introduction of Green Contracts may be concerning to the liquidity in market of such contracts. Liquidity is important for any market segment, however, unless a product is offered we would not be



able to conclusively say whether liquidity would come in the segment or not. We feel that RE Generators / DISCOMs trading in the Day Ahead Market segment would be more than willing to trade in a segment which puts higher value to their product i.e. energy plus the RPO benefit. It may be worth mentioning that initially volumes in the Collective Day Ahead transactions were also low, however, with passage of time this segment has become an important tool in the hands of stakeholders to optimize their portfolio. Thus by creating a window for the participants to trade electricity on a day ahead basis, the Hon'ble Commission fostered a new market segment which now has found its own space. In similar way we expect that the Green Term Ahead Market would also create a niche for itself and serve as an important tool to foster growth of renewable power in the Country.

26. National Contract for G-TAM:

- a. Presently, the Term ahead market contracts are regional contracts. A generator is allowed to bid for sale of power in its own region whereas a buyer can buy power from a supplier from any region. The rationale for the same is that the contracts which materialize on the power exchange must be actually scheduled. When a buyer enters into a contract he already knows the region from which the power will be supplied to him, and also whether there is transmission capacity available for such a contract to get scheduled. Therefore, the regional nature of the



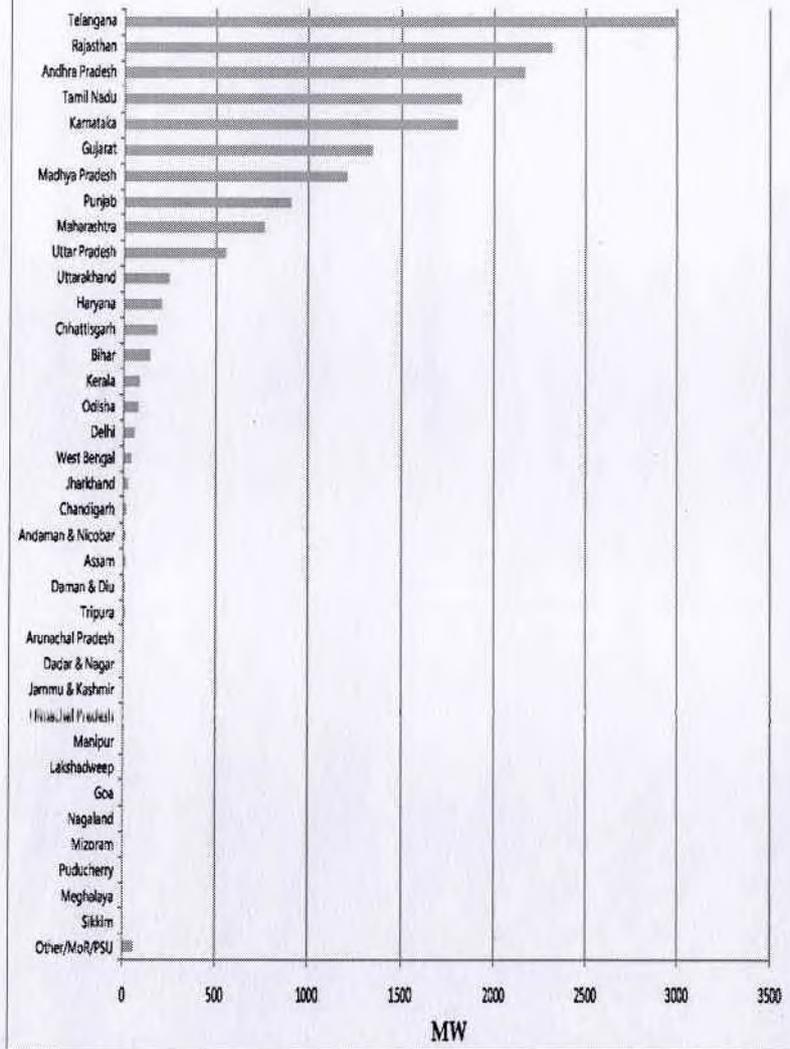
TAM contracts is mainly to make such contracts definite and give the buyer reliability of supply of power.

- b. However, the same concern would not be pertinent when it comes to flow of renewable power in G-TAM. Most of the renewable generators are available in SR and NR while the demand is mostly in ER, WR, and NER. The flow of power in G-TAM contracts would invariably be in the opposite direction in which congestion is frequently witnessed. From the NLDC's monthly ATC on Inter-regional corridor it can be observed that there is no limit specified for export capability from the SR and for NR the Margin available for STOA export is quite sufficient for RE power to flow to other regions. Therefore, concern related to actual delivery of power to the buyer after the trade in the G-TAM would not be a matter of concern.

27. From the chart below we may observe that the Grid Connected Solar Power Capacity (MW) is mainly concentrated in the SR, NR and WR region, with few states having the major concentration of Solar Installed Capacity.

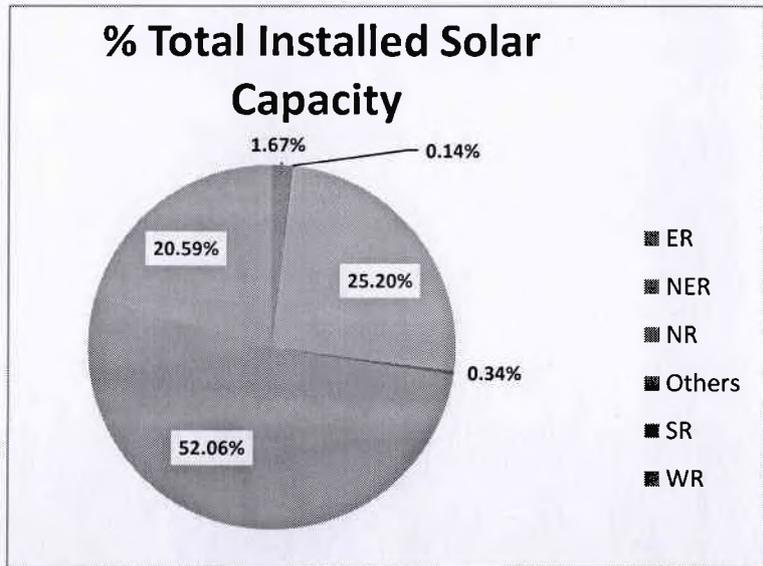


Total cumulative Grid Connected Solar Power Capacity (MW) till 31-12-2017



*Source- National Institute of Solar Energy- Annual Report 2017-18

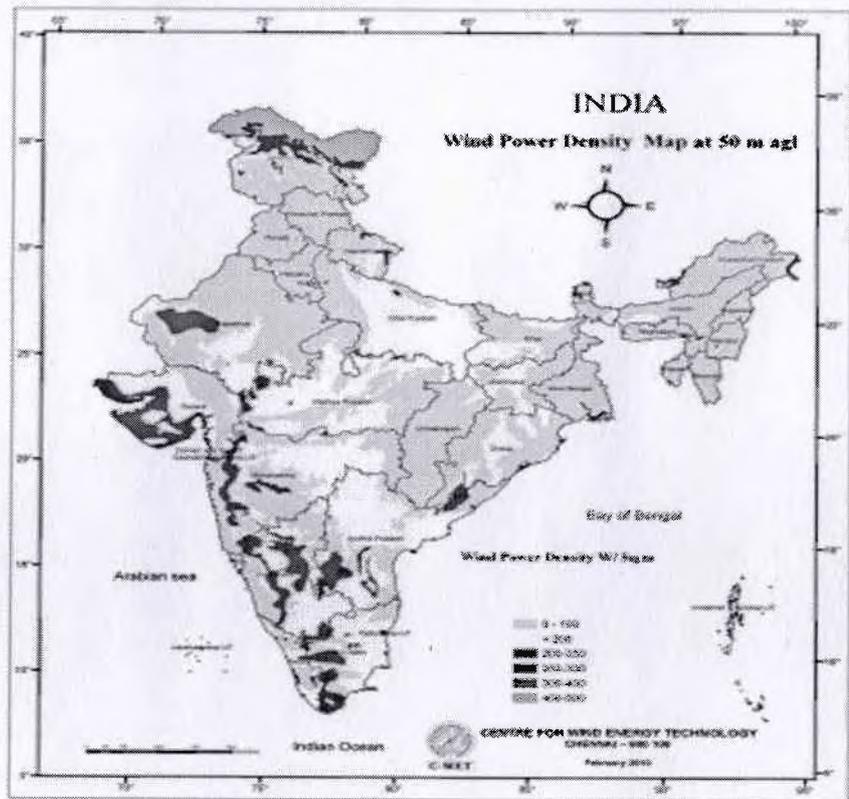




*Source- National Institute of Solar Energy- Annual Report 2017-18

28. Similarly it's observed that the wind power density is highest in western and southern coastal states. Thus these states demonstrate a higher concentration of wind power.





*Source- National Institute of Solar Energy- Annual Report 2017-18

29. India is the fourth largest wind power producer in the world, after China, USA and Germany. A total capacity of 32848 MW has been established up to December, 2017.

Below table provides the State – wise wind power Installed Capacity till 31st December, 2017.

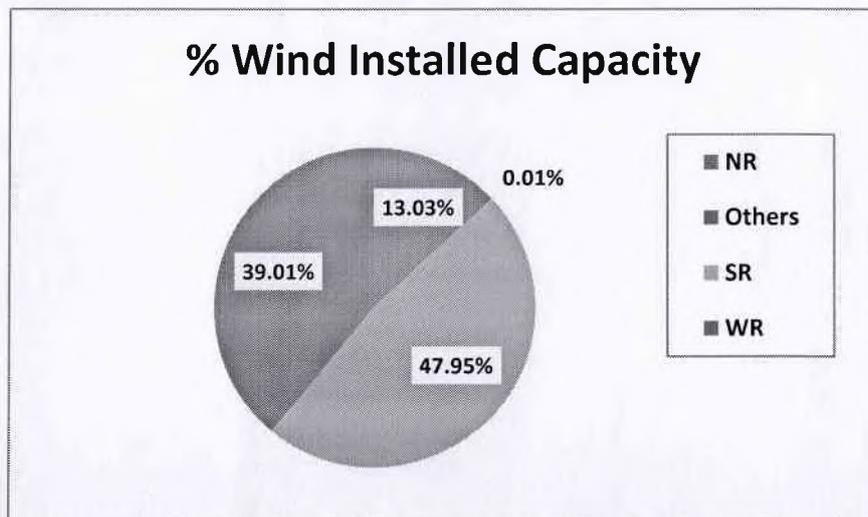


State-wise Wind Power Installed Capacity (MW) (upto 31.12.2017)			
S. No.	State	Region	Wind Power Installed Capacity (MW)
1	Tamil Nadu	SR	7970
2	Gujarat	WR	5537
3	Maharashtra	WR	4778
4	Rajasthan	NR	4282
5	Andhra Pradesh	SR	3835
6	Karnataka	SR	3793
7	Madhya Pradesh	WR	2498
8	Telangana	SR	101
9	Kerala	SR	52
10	Others		4
Total			32848

*Source- National Institute of Solar Energy- Annual Report 2017-18

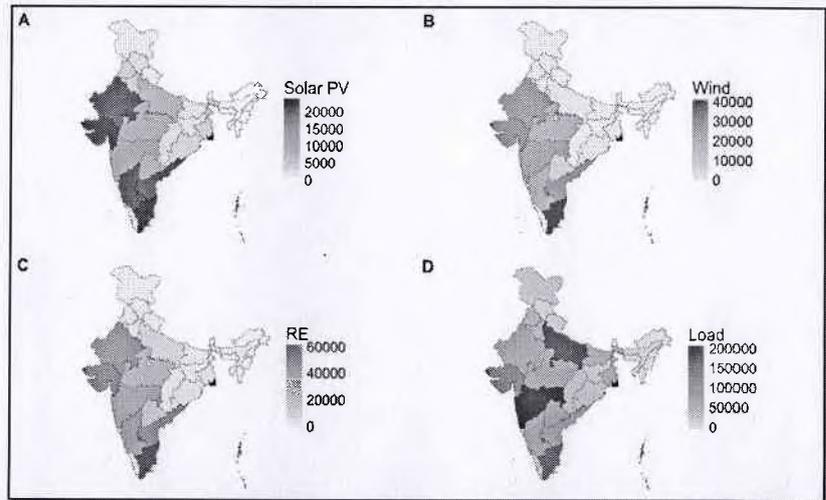
From the table above it is observed that the wind power is most concentrated in the states in SR and WR. The proportion of the same is depicted below:





30. Ministry of Power (MoP), has conducted a study titled ‘Greening the Grid - Pathways to Integrate 175 Gigawatts of Renewable Energy into India’s Electric Grid’, where in the future projection of energy from RE sources has been estimated for the year 2022. Spatial distribution of solar, wind, total variable renewable energy generation and load (gigawatt-hours [GWh]) by state, assuming zero curtailment. (100 GW Solar-60 GW Wind scenario)





*Source- GREENING THE GRID- Pathways to Integrate 175 Gigawatts of Renewable Energy into India's Electric Grid, Vol. I—National Study

31. It is observed from the above figure that in ideal scenario of 100S-60W, in 2022, SR region would have the maximum RE capacity installed. It could be observed that in the future the states from SR and NR would be RE surplus and could supply RE to other states in order to meet with their RPO Compliance.

32. Considering all the above issues the following framework for RE contract at the power exchanges is being proposed.

Framework of RE Contract:

33. It may be mentioned that IEX filed a petition (187/MP/2016) for introduction of G-DAM in September, 2016. The Hon'ble Commission in this matter rejected the proposal of IEX stating that the



market conditions were not conducive for introduction of this product. However, we understand that the market situations have significantly changed from then.

34. The Hon'ble Commission endeavors to strengthen the RE forecasting, scheduling and balancing framework and address the design issues affecting its implementation. In this regard, the Hon'ble Commissions has already approved the Procedures for implementation of the Framework on Forecasting, Scheduling & Imbalance Handling for Renewable Energy (RE) Generating Stations including Power Parks based on wind and solar at Inter-State level. Along with this necessary amendments in CERC (Indian Electricity Grid Code) (Third Amendment) Regulations, 2015 and CERC (Deviation Settlement Mechanism and other related matters) (Second Amendment) Regulations, 2015 have already been incorporated.

35. However, we duly recognize the intermittent nature of renewable generation and limitations associated with the accurate forecasting and scheduling of renewable energy. In this light, G-TAM contracts have been proposed which would be convenient for both RE Sellers (Generators/DISCOMs) and green energy buyers. G-TAM contracts are expected attract enough liquidity considering the present market .



36. IEX proposes Green Term-ahead contracts in Intra-day, Day-ahead contingency and Daily segments each for

Solar and Non-Solar RE Generation. Each contract is being briefly discussed below:

a. **Green Intra-day Contracts (Solar/Non-Solar):**

These contracts are proposed to be traded 3-4 hours before the delivery, however, after introduction of NOAR this can be further brought down to 1-2 hour timeline. In this time frame forecasting error of the RE generator shall be very low and it will be almost certain about its generation schedule as the time of delivery is very close to the time of trade. Thus, such contracts can easily be firm contracts with almost insignificant deviation. Similarly, buyers of green power will be assured about the supply of power. However, instead of having an hourly contract, as in the case of Term Ahead Market, we propose a 15 min contract. We understand that 15 min contracts will be required for RE Sellers to schedule their power accurately as the variation in generation in an hour could be large and this variation is beyond the control of generator. We have seen that variation in generation for solar power could be very high in an interval of an hour. Hence, granularity of 15 min in Intra-Day Contract is being proposed for G-TAM.



However, it may be noted that no revision is permitted in Green Intra-day contract.

b. Green Day-ahead Contingency Contracts (Solar/Non-Solar):

These Contracts will be traded on D-1 day for delivery of power on D day. These contracts will also be on 15 min granularity for the reasons discussed above. Although the time lag between the trade of contract and actual delivery of power is slightly more (ranging from 3 hours to 33 hours) than that in Intra-day Contracts, we believe that Day-ahead Contracts would also be successful to attract enough liquidity. As we have already mentioned that over 1000 MW of solar capacity is registered with IEX. Solar power of around 69 MUs have successfully traded on the IEX platform in the collective market. This data reassures us that RE generators are capable enough to schedule their power on a day-ahead basis with minimum forecasting error.

It may be noted that no revision is permitted in Green Day ahead Contingency Contract or Intra-day contract.

c. Green Daily Contracts (Solar/Non-Solar):

Daily Contracts in G-TAM are proposed to be traded in energy terms (MWhr basis) on T-day for Delivery from T+2 to T+9 i.e. from 3rd day to 10th day (total 8 daily contracts on any day). After succeeding in the trade, Generators will be asked to provide their supply profile for all trades



undertaken, by 7.00 AM of D-1 day, D being the date of delivery, for the entire quantum of energy traded for the day. This supply profile shall be used for the purpose of scheduling the trade.

The proposal of IEX in Daily Contracts for G-TAM is that the trade would take place on Energy Terms (MWhr basis). We believe that bidding in Energy Terms would be a big comfort for RE Seller. An RE Seller would be uncertain about its schedule profile on the Tth day for generation schedule on T+2 to T+9 day i.e. from 3 to 10 days in advance. Asking a RE Seller to give its generation schedule 10 days in advance would be unrealistic in the present scenario. Therefore, bidding in Energy Terms would help eliminate the error in generation forecast. Close to real time Generation can predicted better. Moreover, a seller would trade the quantum of energy not mentioning the time of generation. A buyer would therefore, trade RE power in energy terms, however since it would be aware about the type of contract i.e. Solar or Non-solar, therefore it would have a reasonable assessment of expected time of supply. Final generation schedule (in MW basis) for the energy traded on the Tth Day will be given by the RE seller on a day ahead basis by 0700 hrs. The same would be informed to the buyer by 0800 hrs.



Although there is lag between date of trade and date of scheduling after which open access application will be filed, as described above, the issue of congestion will not be a concern owing to the fact that the flow direction of green power will generally be congestion free (as most of the RE generators are in SR or NR).

An RE Seller can bid in the Green Daily Market with some buffer margin. If his actual schedule generation (on D-1) comes out to be more than energy he has traded (on T day) earlier, the RE generator may use Green Intra-day and Green Day ahead Contingency market, which would be available on D-1, options to sell the excess generation. Green Daily market along with Green Intra-day market and Green Day ahead Contingency market will perfectly complement each other and would give RE Seller required flexibility and safeguard from committing deviation.

Moreover, when the schedule generation (on D-1) will be less than the energy traded (on T day), a 15% deviation in the quantum of generation traded in energy terms and Generation Schedule provided on D-1 basis will be permitted, which will provide further comfort to the generators. Therefore, the RE generator will have a convenience of settling its excess generation as well as any short fall in generation.



Similarly, the buyers would be able to incorporate this supply schedule received from the RE generator in their total demand.

The quantum of generation or the time of generation could be re-balanced by the buyer through other available options (from long-term, medium term, short-term or exchange). Pay-in will be received by the Exchange as per the quantum (MWhr) traded on T day, however, such deviation in D-1 basis shall be refunded to the buyer and seller would be paid on the basis of the schedule provided by them. The pay-out will be released to the generator on the D+1 basis after verification of the final schedule of the day.

In case of Daily contract no deviation shall be allowed after the schedule is provided on D-1 basis.

d. Weekly Contracts (Solar/Non-Solar):

Weekly Contracts in G-TAM (Solar/Non-Solar) are proposed to be traded in energy terms (MWhr basis). Total quantum of energy traded would be then evenly distributed on all seven days for delivery. The quantum of energy to be delivered by the seller would be equal on each day of the week and the sum would be equal to the total energy traded in the weekly contract on the Tth day i.e. Daily Delivery Volume = Total Quantum Traded/7.



We believe that bidding in Energy Terms would be a big comfort for RE generators. Asking a RE generator to give its generation schedule 10 days in advance would be unrealistic in the present scenario. Therefore, bidding in Energy Terms would help eliminate the error in generation forecast. Close to real time Generation can predicted better.

The Green Weekly contract would be traded on every Friday and Saturday of a week for delivery from Monday to Sunday of the upcoming week. Generator will quote the quantum of power along with the price at which it is willing to sell. The seller would not have to define the time-blocks in which it would deliver the power.

After succeeding in the trade, Generators will be asked to provide their supply profile, by 7.00 AM of D-1 day, D being the date of delivery, for the quantum of energy to be delivered. This supply profile shall be used for the purpose of scheduling the trade under day ahead transactions. Final generation schedule (in MW basis) for the energy traded on the Tth Day will be given by the RE generator on a day ahead basis by 0700 hrs. The same would be informed to the buyer by 0800 hrs. With this schedule the time of delivery and the quantum of delivery in a specific time block will be finalized. However, a buyer would be aware about the type of contract i.e. Solar or Non-solar,



therefore it would have a reasonable assessment of expected time of supply even before the actual schedule is given by the RE generator.

Although there is lag between date of trade and date of scheduling after which open access application will be filed, as described above, the issue of congestion will not be a concern owing to the fact that the flow direction of green power will generally be congestion free (as most of the RE generators are in SR or NR).

RE generator may use Green Intra-day and Green Day ahead Contingency market, which would be available on D-1, options to sell the excess generation. Green Intra-day market and Green Day ahead Contingency market would give RE generator required flexibility and safeguard them from committing deviation.

Moreover, when the schedule generation (on D-1) will be less than the energy traded (on T day), a 15% deviation on a daily basis in the quantum of generation traded in energy terms and Generation Schedule provided on D-1 basis will be permitted, which will provide further comfort to the generators. The 15% less generation will be applicable on a daily basis and not for the week on net basis. Moreover, the shortfall in the generation on a day cannot be compensated by an RE generator by generating excess power on the



upcoming days of the week or by excess generation done prior in the week.

Buyers would be able to incorporate the supply schedule received from the RE generator in their total demand. The permissible 15% shortfall in generation or the time of generation could be re-balanced by the buyer through other available options (from long-term, medium term, short-term or exchange).

Pay-in will be received by the exchange as per the quantum (MWhr) traded on T day, however, such deviation in D-1 basis shall be refunded to the buyer and seller would be paid on the basis of the schedule provided by them. The pay-out will be released to the generator on the D+1 basis after verification of the final schedule of the day.

Eligible Entities:

37. Solar Energy sellers shall be eligible to trade in 'Solar Term Ahead Contract' and Non-Solar RE Seller shall be eligible to trade in 'Non-Solar Term Ahead Contract'. To ascertain eligibility, RLDC/SLDCs may issue NoC/Standing clearance (Green NoC). Green NoC may contain special mentioning of category and type of RE generator along with other details i.e. Solar/Non-Solar & Source i.e. Solar/Wind/Hydro etc. in the Green NOC. A DISCOM may get Green NoC (Solar/Non-Solar) for selling renewable energy from the respective SLDCs.



38. Eligibility of RE sellers shall be ascertained at the time of registration at the Exchange based on NOC/Standing clearance issued by RLDC/SLDC, as applicable.
39. RE Seller having merchant green power capacity shall be eligible to participate in G-TAM subject to applicable regulations notified by the Appropriate Commission.
40. Other category of sellers could be such sellers who have constructed plants before their committed COD and their beneficiaries are not willing to advance the COD for such assets. Captive RE generators, having capacity over and above what they need can also be allowed to participate in this segment after getting NoC from their respective SLDC.
41. All the entities which are eligible to procure power through Open Access shall be eligible to participate in G-TAM as buyer. A separate certificate will be issued by the Exchange detailing various trades undertaken by the buyers, which shall be used for meeting RPO compliance of such buyers
42. Buyers shall be eligible to participate in the G-TAM based on the same NoC issued for DAM/Intra-Day market by SLDC. No separate NoC is required for the buyers.



43. Risk management, bidding mechanism, price discovery methodology, scheduling, and delivery point will be according to the existing process followed in the TAM.

Green Day-Ahead Contingency Contracts (Solar/Non-Solar):

S. No.	Item	Details
1	Contract Name	Green Day-Ahead Contingency Contracts (Solar/ Non-Solar)
2	Contract Code	“Type of Contract- Time block” E.g.(GDACSL-01) or (GDACNS-01) Where, GDAC: Green Day Ahead Contingency contracts SL: Solar NS: Non-Solar 01:Time block number 1, starting from 00:00 hours to 00:15 hours
3	Contract Type	Delivery Option - Firm Delivery
4	Contract available for Trading	15 mins contracts for next day from 1 st time block to 96 th time block i.e. 96 contracts of 15 mins each.
5	Trading day	A day before delivery day or as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids.
8	Matching of Bids	Continuous trade session. Details in clause 5 (B) of Schedule B of Business Rules. Each trade will be sent for scheduling, on trade to trade basis.
9	Trading Hours	Continuous trade session: 03.00 PM to 11.00 PM on trading



		day i.e. one day before delivery date or as per trading calendar
10	Minimum Volume quotation	1 MW
11	Minimum Volume Step	1 MW
12	Lot size	1 MW * 15 mins
13	Maximum bid size*	Bids should not be more than the allowed MW in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWh (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
16	Volume Tick size	1 MWh
17	Quantity Variation	Zero quantity variation allowed.
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)*	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fee*	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	Delivery shall commence 3 hours after expiry of the contract. Trade once executed shall not be revised and shall be sent for scheduling, and at no point of time during the contract period shall be allowed to be revised. The quantity shall be deliverable as per the schedule issued by the respective RLDC.



22	Delivery period	Delivery for each 15 min time block.
23	Delivery point	The delivery point shall be at Seller's Regional Periphery as per Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time.
24	Application for Scheduling	Application for Scheduling will be Submitted to Nodal RLDC on Contingency basis as per the "Procedure for Scheduling of bilateral transactions"
25	SLDC Clearance	The buyer and seller will have to take concurrence from their respective SLDC for scheduling of Power. This concurrence has to be submitted as per the timelines specified in the Trading and Delivery Calendar. NOC / Prior Standing Clearance issued by the SLDC in format PX-I as per CERC (Interstate Open Access) Regulations, are also valid for these transactions.
26	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
27	Alternate route	Unless preference is specified by the buyer, he will be deemed to have consented for all possible transmission corridors from seller's injection point till drawal point.
28	Force majeure	In case of force majeure, the Exchange will settle the contract as



		per final schedule issued by RLDCs.
29	Fines & penalties*	As decided by the Exchange from time to time and informed through circular.
30	Payment of Application fees, Transmission & Operating Charges by Members	Application fees, Transmission and Operating Charges as applicable on quantum scheduled at the delivery point and payable to the Nodal RLDC, will be recovered from the buyer and seller members on receipt of acceptance from the nodal RLDC.
31	Funds pay in by Members	Exchange will debit/adjust the funds pay-in on the day of trade from buyer's member /clients, as applicable. Excess margins, if any due to partial concurrence received will be refunded back to the member on the settlement day.
32	Funds pay out to Members	Exchange will credit the funds pay out in seller's member's settlement account on D+1 basis at 12.00 noon for each delivery day subject to confirmation of delivery pay in by the seller.
33	Continuous Trade Session (Daily)	1500 – 2300
34	SLDC Clearance and Declaration Form sent to Members	As specified in G-TAM Trading and Settlement Calendar
35	Submission of SLDC Clearance to the Exchange by the Member	As specified in G-TAM Trading and Settlement Calendar
36	Submission of Application to Nodal RLDC	As per Procedure for scheduling of Bilateral transactions
37	Approval from nodal RLDC	As per CERC Order dated 08.04.2015 in Petition no. 006/SM/2015.
	Pay in/ adjustment on T+1 basis where	Post receipt of nodal RLDC approval



	T is the trading day	
	Payout on T+2 basis where T is the trading day	By 1100
38	Payment of charges to Nodal RLDC as per Procedure for Scheduling of Bilateral Transaction.	1500
39	Application for Scheduling will be sent only when the SLDC Clearances from buyer and seller are received by the Exchange. In case, the SLDC approval is not received from SLDCs of buyer/ seller as specified in Trading and Delivery Calendar, then it will be considered as default by buyer/seller.	

Green Intra Day Contracts (Solar/Non-Solar):

S. No.	Topic	Details
1	Contract Name	Green Intra Day Contracts (Solar/ Non-Solar)
2	Contract Code	<p>“Type of Contract- “Time block No.” (E.g.GITDSL-01) (E.g.GITDNS-01) Where, GITD: Green Intraday Contracts SL: Solar NS: Non-Solar 01:Time block number 1, starting from 00:00 hours to 00:15 hours</p>
3	Contract Type	Delivery Option - Firm Delivery
4	Contract available for Trading	15 mins contracts for next day from 1 st time block to 96 th time block i.e. 96 contracts of 15 mins each.
5	Trading day	Every calendar day of the year for same delivery date.



6	Trading Session	Continuous Trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids.
8	Matching of Bids	Continuous trade session: Details in clause no. 5 (B) of Schedule B of Business Rules. Each trade will be sent for scheduling, on trade to trade basis.
9	Trading Hours	Continuous trade session: 0030 hrs to 2000 hrs on trading days
10	Minimum Volume Quotation	1 MW
11	Minimum Volume Step	1 MW
12	Lot size	1 MW*15 mins
13	Maximum bid size	Bids should not be more than the allowed MW in any of Concurrence/clearance issued by its SLDC to the members/clients at any time. It will be the responsibility of the member to adhere to this rule.
14	Price Quote Basis	Rs. per MWh (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
16	Volume Tick size	1 MWh
17	Quantity Variation	Zero quantity variation allowed.
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fees	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.



21	Continuous Trade Session (Daily)	0030 hrs to 2000 hrs
22	Delivery	Delivery shall commence 3 hours after expiry of the contract. Trade once executed shall not be revised and shall be sent for scheduling, and at no point of time during the contract period shall be allowed to be revised. The quantity shall be deliverable as per the schedule issued by the respective RLDC.
23	Delivery period	Delivery for each hour.
24	Delivery point	The delivery point shall be at Seller's Regional Periphery as per Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time.
25	Application for Scheduling	Application for Scheduling will be Submitted to Nodal RLDC on Contingency basis as per the "Procedure for Scheduling of bilateral transactions".
26	SLDC Clearance	The buyer and seller will have to take concurrence from their respective SLDC for scheduling of Power. This concurrence has to be submitted as per the timelines specified in the Trading and Delivery Calendar. NOC / Prior Standing Clearance issued by the SLDC in format PX-I as per CERC (Interstate Open Access) Regulations, are also valid for these transactions.
27	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled



		at seller's Regional Periphery.
28	Alternate route	The buyer will be deemed to have consented for all possible routes; however, they can give preference amongst the possible routes.
29	Force majeure	In case of force majeure, the Exchange will settle the contract as per final schedule issued by RLDCs.
30	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
31	Payment of Application fees, Transmission & Operating Charges by Members	Application fees. Transmission and Operating Charges as applicable on quantum scheduled at the delivery point and payable to the Nodal RLDC will be recovered from the buyer and seller members on receipt of the acceptance from the nodal RLDC.
32	Funds pay in by Members	Exchange will debit/ adjust the funds pay-in on the next day of trading from buyer's member/ clients as applicable. Excess margins, if any due to partial concurrence received will be refunded back to the member on the settlement day.
33	Funds pay out to Members	Amount equivalent to net obligation will be credited at 12.00 noon on T+1 basis (where T stands for Trading day.)
34	Continuous Trade Session (Daily)	0030 hrs to 2000 hrs
35	SLDC Clearance and Declaration Form sent to Members	As specified in G-TAM Trading and Settlement Calendar
36	Submission of SLDC Clearance to the Exchange by the	As specified in G-TAM Trading and Settlement Calendar



	Member	
37	Submission of Application to Nodal RLDC	As per Procedure for Scheduling of Bilateral Transaction.
38	Approval from nodal RLDC	As per CERC Order dated 08.04.2015 in Petition no. 006/SM/2015.
39	Payin /adjustment on T+1 basis where T is the trading day	Post receipt of nodal RLDC approval
40	Payout on T+2 basis where T is the trading day	By 1100
41	Payment of charges to Nodal RLDC as per "Procedure for Scheduling of Bilateral Transaction".	1500
42	Application for Scheduling will be sent only when the SLDC Clearances from buyer and seller are received by the Exchange. In case, the SLDC approval is not received from SLDCs of buyer/ seller as per specified in Trading and Delivery Calendar, then it will be considered as default by buyer/seller.	



Green Daily Contract (Solar/Non-Solar)

S. No.	Item	Details
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1	Contract Name	Green Daily Contracts
2	Contract Code	“Type of Contract- Day No.” (E.g.GDYSL-DDMM) (E.g.GDYNS-DDMM) Where, GDY: Green Daily Contracts SL: Solar NS: Non-Solar DD: Day MM: Month
3	Contract Type	Delivery Option - Firm Delivery subject to a downward variation up to 15% of Energy Traded
4	Contract available for Trading	Energy in terms of MWhr to be supplied on the day according to generation schedule provided by supplier on D-1 basis
5	Trading day	Trading will be available on all days as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids and matching shall take place on Price-Time priority basis.



8	Matching of Bids	Through a continuous trade session.
9	Trading Hours	Continuous trade session: 01.00 PM to 05.00 PM on trading day or as per trading calendar.
10	Minimum Volume quotation	1 MWhr
11	Volume Tick size	1 MWhr
13	Maximum bid size	Bids should not be more than the allowed MWhr in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWhr (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
17	Quantity Variation	Downward variation up to 15% of Energy Traded. .
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fee	Fees payable by buyer and seller to Exchange for the quantity approved by



		nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	The quantity shall be deliverable as per the schedule issued by the RLDC.
22	Delivery Point	At the Regional periphery.
23	SLDC Clearance	After trading on the exchange, the buyer and seller will have to take a concurrence of their respective SLDCs. This concurrence has to be submitted to the exchange as per the timelines specified in the trading and delivery calendar.
24	Application for scheduling	Application for Scheduling will be submitted to Nodal RLDC as specified in the Trading Calendar and as per the "Procedure for scheduling of bilateral transactions".
25	Delivery Process	Application for scheduling, as specified in the trading and delivery calendar shall be sent to the Nodal RLDC for Contingency transactions as per the "Procedure for scheduling of bilateral transactions".
26	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point



		up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
27	Force majeure	In case of force majeure the Exchange will settle the contract as per final schedule issued by RLDCs.
28	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
29	Submission of SLDC Clearance to the Exchange by the Member	Along with Generation Schedule on D-1 basis or as specified in GTAM Trading and Settlement Calendar
30	Payment of Application fees, Transmission & Operating Charges by Members	Application fees will be collected from buyer on date of application to Nodal RLDC. Transmission and Operating Charges as applicable on quantum scheduled at seller's periphery and payable to the Nodal RLDC, will be recovered from the buyer and seller members on the next day of receiving the acceptance from the nodal RLDC.
31	Funds pay in by Members	Exchange will debit the funds pay-in on each D-1 basis at 11.00 am from buyer's member's settlement account.



32	Funds pay out to Members	Exchange will credit the funds pay-out in seller's member's settlement account on D+1 basis at 12.00 noon subject to confirmation of delivery pay in by the seller.
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Green Weekly Contract (Solar/Non-Solar)

S. No.	Item	Details
1	Contract Name	Green Weekly Contracts
2	Contract Code	"Type of Contract- Day No." (E.g.GWKSL-MMWN) (E.g. GWKSL-MMWN) Where, SL: Solar NS: Non-Solar WN: Week Number MM: Month
3	Contract Type	Delivery Option - Firm Delivery subject to a downward variation up to 15% of Energy Traded
4	Contract available for Trading	Energy in terms of MWhr to be supplied on all days of the week (Monday to Sunday) according to generation schedule provided by supplier on D-1 basis.
5	Trading day	Trading will be available on all days as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to



		the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids and matching shall take place on Price-Time priority basis.
8	Matching of Bids	Through a continuous trade session.
9	Trading Hours	Continuous trade session: 01.00 PM to 05.00 PM on trading day or as per trading calendar.
10	Minimum Volume quotation	7 MWhr
11	Volume Tick size	7 MWhr
13	Maximum bid size	Bids should not be more than the allowed MW/hr in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWhr (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
17	Quantity Variation	Downward variation up to 15% of Energy Traded. .
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.



19	Initial Margins (Operational Limit)	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fee	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	The quantity shall be deliverable as per the schedule issued by the RLDC.
22	Delivery Point	At the Regional periphery.
23	SLDC Clearance	After trading on the exchange, the buyer and seller will have to take a concurrence of their respective SLDCs. This concurrence has to be submitted to the exchange as per the timelines specified in the trading and delivery calendar.
24	Application for scheduling	Application for Scheduling will be submitted to Nodal RLDC as specified in the Trading Calendar and as per the "Procedure for scheduling of bilateral transactions".
25	Delivery Process	Application for scheduling, as specified in the trading and delivery calendar shall be sent to the Nodal RLDC for Contingency transactions as per the "Procedure for scheduling of bilateral transactions".
26	Application fees, Operating and Transmission	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the



	Charges and Losses	Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
27	Force majeure	In case of force majeure the Exchange will settle the contract as per final schedule issued by RLDCs.
28	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
29	Submission of SLDC Clearance to the Exchange by the Member	Along with Generation Schedule on D-1 basis or as specified in GTAM Trading and Settlement Calendar
30	Payment of Application fees, Transmission & Operating Charges by Members	Application fees will be collected from buyer on date of application to Nodal RLDC. Transmission and Operating Charges as applicable on quantum scheduled at seller's periphery and payable to the Nodal RLDC will be recovered from the buyer and seller members on the next day of receiving the acceptance from the nodal RLDC.
31	Funds pay in by Members	Exchange will debit the funds pay-in on each D-1 basis at 11.00 am from buyer's member's settlement account.



32	Funds pay out to Members	Exchange will credit the funds pay-out in seller's member's settlement account on D+1 basis at 12.00 noon subject to confirmation of delivery pay in by the seller.
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44. Benefits of the proposed Green Term Ahead Contracts:

- a. Provide new avenue to RE merchant capacity to sell power. New RE merchant plants may come up which will inter-alia help to achieve ambitious renewable capacity addition targets of the GoI.
- b. Aid in the development of RE capacity in India. A market based mechanism where RE surplus and RE deficit states would trade RE power and balance their RPO targets would incentivize RE resource rich states to develop RE capacity beyond their own obligation.
- c. Lessen burden on Renewable rich State to absorb all RE power generated within the State.
- d. Green Power Contracts will enable obligated entities procure renewable power at competitive prices at the power exchanges and help meet RPOs.
- e. Discoms preference of buying green power over REC is addressed.
- f. RE Sellers and Buyers will get more options to sell/buy renewable power.
- g. RE Generator need not tie up capacity in advance or depend on PPA with the Discoms especially when the tariffs discovered in the PPAs are falling sharply.



- h. Small participants (OA/CPP) can buy green power at competitive rates to meet their RPO as well as energy requirement.
- i. RE generators under preferential tariff in States having excess wind/solar power are being curtailed due to Discoms' inability to pay. Such generators will now be able to sell power in the market.

45. In view of the above and considering the overall development of RE market, it is submitted that the Honorable Commission may accord approval to launch proposed Green Term Ahead Contracts at IEX platform.



Prayer:

In the premise the Petitioner respectfully submits that this Hon'ble Commission may be pleased to:

- a. Accord approval of introduction of proposed Green Term Ahead Market Contracts on IEX platform.
- b. Consider holding that the power bought in the proposed Green Contracts from the Exchange shall be eligible for RPO compliance by obligated entities.
- c. Amend Regulations / Procedures required for introducing of Green Term Ahead Contracts on Exchange platform.
- d. Accord approval to Schedule E (regarding introduction of G-TAM) to be incorporated in the Business Rules of IEX.
- e. Pass such further order or orders as may be considered.

For Indian Energy Exchange Limited



**INDRANIL CHATTERJEE
CHIEF RISK OFFICER**

At: New Delhi

Dated: 26th November, 2018



**BEFORE THE CENTRAL ELECTRICITY
REGULATORY COMMISSION,
3RD AND 4TH FLOOR, CHANDRALOK
BUILDING, JANPATH, NEW DELHI**

PETITION NO.

IN THE MATTER OF:

Petition under Section 66 of The Electricity Act, 2003 read with the Regulation 7 of the Central Electricity Regulatory Commission (Power Market) Regulations, 2010 for approval of introduction of the Green Term-Ahead Market (Renewable Energy) Contracts at Indian Energy Exchange Ltd

AND IN THE MATTER OF:

Indian Energy Exchange Ltd,

--- Petitioner

4th Floor, TDI Centre,

Plot No. 7, Jasol

New Delhi 110 025



Sim

AFFIDAVIT

I, Indranil Chatterjee, Son of R.N. Chatterjee aged about 41 years and having my office at Fourth Floor, TDI Centre, Plot No. 7, Jasola District Centre, New Delhi — 110025 do hereby solemnly state as under.

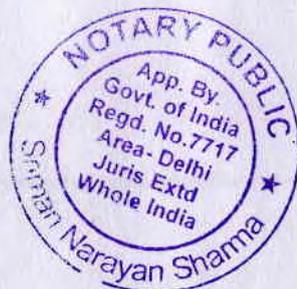
1. I am working as Chief Risk Officer in the Indian Energy Exchange Limited, New Delhi, and I am well conversant with the facts of the case and hence competent and authorized to sign this affidavit.
2. I have gone through the contents of the above Petition and I say that the facts stated therein are based on the records of the Petitioner and believed by the deponent to be true.


DEPONENT

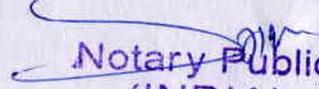
VERIFICATION

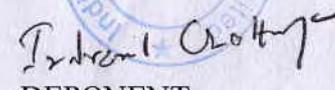
I, the deponent above named do hereby verify that the contents of my above affidavit are true to my knowledge, no part of it is false and nothing material has been concealed therefrom.

Verified at New Delhi on 26th day of November 2018.



ATTESTE


Notary Public
(INDIA)


DEPONENT

26 NOV 2018

ANNEXURE - 1

From: "PC Maithani" <pcmaithani@nic.in>

Date: Apr 16, 2018 5:49:15 PM

Subject: Trading of Renewable Power in Energy Exchanges- opening a separate trading window –reg.

To: sngoel@iexindia.com

Cc: "Addl. MNRE" <as.mnre@gov.in>, rajesh.mediratta@iexindia.com

To: MD & CEO, Indian Energy Exchange Limited (IEX)

Subject: Trading of Renewable Power in Energy Exchanges- opening a separate trading window –reg.

Dear Sir,

Renewable power in India has reached maturity in terms of volume, forecasting certainty, cost competitiveness, players in the market, and risk perception. Opening up a separate renewable energy trading window in exchanges will lead to enhanced visibility and also create an organized competition out of the shadow of conventional power. General observation and interaction with various stakeholders validates the perception.

2. Separate renewables power trading window (*separate for solar & non-solar*) will also lead to explicit pricing comparison between the conventional and renewable power purchase options. Spot energy buyers will have an option to choose among the two for cost of power and /or environmental attribute consideration. Such power will emanate from renewables based merchant power plants or such plants that have availability of un-tied power over and above PPA obligations.

3. It may be mentioned that in July 2017, the Central Electricity Regulatory Commission (CERC) had rejected the IEX proposal for G-DAM stating that the market condition at present is not conducive for introduction of this product. Since then the situation has significantly changed.

4. In view of the above, the Energy Exchanges are requested to examine the option of opening separate renewable power trading window and after weighing the likely gains, initiate further action accordingly.

Look forward to an early response.

regards,

Dr P.C.Maithani

Adviser

Ministry of New and Renewable Energy

B-14 CGO Complex, Lodhi Road

New Delhi-110003

Ph: 91-11-24361830





Minutes of the Meeting: Brainstorming Session on "Power Selling options for Renewable Generators"

Date: 5th June 2018

Venue: Hotel Eros, Nehru Place, New Delhi

1. Welcome and Opening Remarks

Mr. Rajesh K Mediratta welcomed the participants and apprised them with the purpose of the meeting. He emphasized the importance of exploring new avenues for Renewable Generators to sell power under merchant route.

2. Presentation by IEX

IEX team gave the presentation on "Green Power Market" covering the following:

- Options with Renewable generator
 - Bundled Green Power
 - Unbundled Green Power + REC
- Green Power market- Options
 - Green Day Ahead Market (G-DAM)
 - Green Term Ahead Market (G-TAM)
- Market Design
- Challenges & Way forward

3. Key Points for Brainstorming

The presentation on "Green Power Market" covered the following:

- Scope for Merchant RE Capacity in India.
- Can 175 GW of RE capacity can be promoted only through FiT or Competitive bidding?
- Need for Exchange based Green power market.
- Eligibility for REC in case selling as unbundled power
- Design features of Green Power Market
 - How to address the infirm nature of RE generation?
 - Deviation settlement mechanism
 - UI based or absolute error based methodology?

4. Key Finding and Recommendations

- Participant welcomed the idea and need of a green power market
 - Avenues in addition to competitive bidding is needed
 - More option will result in portfolio diversification by RE generator & Better IRR
 - Merchant capacity is required





- Design features of Green Power Market
 - National contract can be introduced
 - Participant preferred both G-DAM & G-TAM
 - Deviation by RE generator selling power at Exchange (Bundled or unbundled) to be settled as per States F&S Regulation (Absolute error % based)
- Exchange should offer various RE products
- Provision to set up merchant capacity over and above the capacity tied up under competitive bidding (SECI/NTPC)
- Excess generation from RE plants under Competitive bidding to be allowed to easily sell at exchange.

The Meeting ended with a vote of thanks to the participants.

List of Participants enclosed as Annexure 1.





List of Participants

S.No	Contact Person	Designation	Company Name
1	Mr. Tushal Goyal	Assistant Manager	Mytrah Energy
2	Mr. Waqas Ahmed	Manager- Regulatory	Wind World India Ltd
3	Mr. Rohan Gupta	Deputy Manager	Wind World India Ltd
4	Mr. Mohit Arora	Director	SNCA Energy
5	Mr. Ashish Ashra	Sr. Analyst	Canadian Solar
6	Mr. Mayank Bhagat	Sr. Executive	Adani Green Energy Ltd
7	Mr. S.K Padhi	Director	Poysha Generation
8	Mr. Pranav Kuraria	AGM	BVG Solar
9	Mr. Durgesh Gupta	Associate Manager	Adani Green Energy Ltd
10	Mr. Manish Verma	Head Regulatory	CLP India Ltd
11	Mr. Vaibhav Kholia	Associate (Renewable Energy)	World Business Council for Sustainable Development
12	Mr. Pranav Mehta	Chairman	National Solar Energy Federation of India
13	Mr. Ashish Nandan	Head Regulatory Affairs	Enel Green Power
14	Mr. Anish Bansal	Manager-Commercial	GREENKO Energy
15	Mr. Soumya Maiti	Manager	Amplus Energy
16	Mr. Gaurav Saini	Sr. Executive	Hero Future Energies
17	Mr. Tarini Sahoo	Asst. Manager	linko Solar
18	Mr. Rajiv Malik	Project Manager	Lohia Group
19	Mr. Rajesh K Mediratta	Director (BD)	IEX
20	Mr. Rohit Bajaj	VP	IEX
21	Mr. Nitin Sabikhi	AVP	IEX
22	Mr. Shalabh Srivastava	Asst. Manager	IEX
23	Mr Sibasis Panda	Asst. Manager	IEX
24	Mr. Harmeet Chhabra	Sr. Executive	IEX



Annexure-3

**SCHEDULE E: GREEN TERM-AHEAD MARKET (G-TAM)
SEGMENT**

This market segment will cover all renewable electricity contracts. This will cover market timeframes of green - intra-day, green day-ahead contingency and green daily contracts as allowed by the Commission. The Term Ahead Market will operate in accordance with the procedures issued by CTU for 'Scheduling of Bilateral Transactions'. All terms and conditions of the contracts including trading sessions, matching rules, margin requirement and delivery procedure etc. will be as per specific rules mentioned herein.

1. Contracts

The Exchange shall make the contracts as specified in this section available for trading as per the trading calendar. These contracts will be traded in accordance with provisions of trading as specified in the respective Contract Specification. The trade sessions, matching rules applied in each trade session for concluding the contracts, risk management and settlement for such contracts will be as per specific contract specifications provided herein. The delivery of such contracts will be in accordance with CERC (Open Access in Inter-State Transmission) Regulations, 2008, as amended from time to time and relevant procedures issued by CTU and by Open Access Regulations of concerned State. The Exchange holds the right to modify all other parameters except those specified in regulation 7 of CERC (Power Market) Regulation, 2010.



Following contracts shall be available for trading in Green Term-Ahead Market:

1.1 **Green Day-Ahead Contingency Contracts**

The Exchange shall make the 96-15 minute contracts available for trading on day-ahead basis for 00:00 hours to 24:00 hours of next day. The Exchange will carry out trading in such contracts either through 'Uniform Price Step Auction' or 'Continuous Trade' sessions or a combination of both depending on market feedback. The timeline for trade matching sessions will be specified in Contract Specifications. They will be sent for scheduling in accordance with CERC (Open Access in Inter-State Transmission) Regulation, 2008, as amended from time to time and relevant procedures issued by CTU as specified in the contract specifications. The Exchange holds the right to modify parameters as specified by CERC. The contract specifications are given at Annexure- E1

1.2 **Green Intra-Day Contracts**

The Exchange shall make the Green Intra Day contracts available for trading 15 min contracts on same day or previous day on rolling 15 min basis till some hour prior to the delivery of electricity as specified in the contract specification. The Exchange will carry out trading in such contracts through 'Continuous Trade'. The timeline for trade matching sessions will be specified in Contract Specifications. They will be sent for scheduling in accordance with CERC (Open Access in Inter-State Transmission) Regulation, 2008, as amended from time to time and relevant procedures issued by CTU as specified in the contract specifications. The Exchange holds the right to modify



parameters as specified by CERC. The contract specifications are given at Annexure- E2.

1.3 Green Daily Contracts

The Exchange shall make the green daily contracts available for trading of Green Energy for any specific day, up to a period specified by CERC. The Exchange will carry out trading in such contracts either through 'Uniform Price Step Auction' or 'Continuous Trade' sessions or a combination of both depending on market feedback. The timeline for trade matching sessions will be specified in Contract Specifications. They will be sent for scheduling in accordance with CERC (Open Access in Inter-State Transmission) Regulation, 2008, as amended from time to time and relevant procedures issued by CTU as specified in the contract specifications. The contracts may contain provisions allowing quantity variation in delivery. The Exchange holds the right to modify parameters as specified by CERC. The contract specifications are given at Annexure- E3.

1.4 Green Weekly Contracts

The Exchange shall make the green weekly contracts available for trading of Green Energy for any specific day, up to a period specified by CERC. The Exchange will carry out trading in such contracts either through 'Uniform Price Step Auction' or 'Continuous Trade' sessions or a combination of both depending on market feedback. The timeline for trade matching sessions will be specified in Contract Specifications. They will be sent for scheduling in accordance with CERC (Open Access in Inter-State Transmission) Regulation, 2008, as amended from time to time and relevant procedures issued by CTU as specified in the



contract specifications. The contracts may contain provisions allowing quantity variation in delivery. The Exchange holds the right to modify parameters as specified by CERC. The contract specifications are given at Annexure- E4.

2. Trading Days and trading hours

The Exchange shall operate this segment on all days except Exchange specified holidays. The Exchange shall declare trading calendar indicating trading sessions and trading days for each of Contracts on quarterly basis. The Exchange may extend, advance or reduce trading hours by notifying the Members as and when it deems fit and necessary.

3. Matching Methodologies

The matching of contracts will employ different matching methodologies. The two matching methodologies are explained below.

A. Uniform Price Step Auction

In such trading session, the participants submit their orders for sale and buy during the call auction phase. Such orders are automatically stored in the order book without giving rise to Contracts. After the end of the call auction phase, there is a call auction freeze phase. Until the call auction freeze phrase, members can enter new orders (or quotes) or modify their existing orders. Execution of trade takes place after the call auction freeze phase is over. The matching of orders takes place in accordance with matching rules given in subsequent sections. All trades are effected at uniform price known as Equilibrium Price (EP). All orders that have prices that are better than the equilibrium price are executed, and the ones that have a price



equal to the equilibrium price are executed according to a First In First Out (FIFO) algorithm. The algorithm for determining Equilibrium Price is given in the matching rules.

In such auction, the transmission network constraints are not considered implicitly while matching the orders.

One of the following two auction methodologies will be adopted at any point of time.

1. **Closed uniform price auction:** In closed auction, the orders are not disclosed to market participants and information regarding the equilibrium price and surplus are informed to market participants only after the call auction phase.
2. **Open uniform price auction:** In the open auction, the participants submit their order for sale and buy during the auction phase. Complete list of order prices and aggregated quantities of buy and sale bids will be displayed to market participants maintaining bidder's anonymity. The participants can modify, delete or enter new orders during call auction period.

B. Continuous Trade Session

In such trading session, the participants shall submit buy and sale offers on a continuous basis during the trading period. The buyers and sellers will be matched on continuous basis with price-time priority. For a specific Contract, the seller with minimum quote and buyer with the maximum quote are considered as best seller and best buyer. Best five buy and sell bids, excluding the details of participants, shall be displayed on the trader's work station (TWS) to all the participants to



show the market depth. In case, best buy order is better than or same as best sale order, they will be matched resulting into Contracts. Such matching will continue till the end of trading period. In case, best buy order is worse than the best sale, they will continue to be available in the order book, without resulting into Contracts.

Market depth of best five orders in terms of price shall be displayed to all the participants. Order-depth option displays the best five placed orders in terms of price; whereas Price-depth option displays the best five prices by cumulating the volumes under similarly priced bids.

4. Order Management

The Exchange may launch more than one order book running either parallel or at different time spans.

All **Clients** shall be assigned unique client ID / Portfolio ID code which may be same or different for different market segments

The types of order available in different trading sessions are mentioned below.

i. Uniform Price Step Auction Session

Following orders types are available in this auction session.

a) Timing Constraints

a. End of Session (EOS)

Valid for auction session only.

ii. Continuous Trade Session



Following orders are available in the Continuous Trade Session.

(a) Timing Constraints

I. Rest of day (Day)

The order will be valid till the end of trading hours of that trading day.

II. Immediate or Cancel (IOC)

The order placed will be not be in pending status and will be cancelled immediately in case if not traded.

III. End of Session (EOS)

(b) Execution constraints

I. Fill or Kill (FoK)

This order will match the whole order OR delete the whole order.

5. Matching Rules

Only with prior approval of CERC, the Exchange may modify or change the matching rules relevant to any market or order books. The matching rules for different trading sessions are mentioned below.

A) Uniform Price Step Auction

A Matching of the auction will only take place if there are crossing prices (buy price \geq Sell Price) in the order book, that is,



if the best bid price is equal to or higher than the best ask price. In that case, the equilibrium price is determined according to the following criteria:

1. Maximum tradable volume: The Equilibrium Price will be the price at which there is maximum tradable volume.
2. Minimum unbalance: If there is more than one price with equal value for maximum tradable volume, the price that leaves the least volume untraded at its level is chosen as Equilibrium Price.

If Auction Session has overlapping Buy and Sell orders resulting in at least 1 trade (if there are crossing prices i.e. best buy price \geq best Sell Price) then the system would use the below mentioned principles to determine that Session's Auction Uniform Price. If system achieves more than one potential Auction Uniform Price by Principle 1, then the algorithm would move to Principle 2 to narrow down the options and so on. If any Principle achieves a single potential Auction Uniform Price, then that price would be assigned as that Session's Auction Uniform Price.

The Auction Uniform Price calculation logic is explained below with the help of an example:

The Order Book would be sorted on Best Buy and Best Sell basis for a product e.g. 'AUCREC SOLAR' at the end of the Auction session as below:

BUY	SELL
-----	------



Order	Qty	Price	Price	Qty	Order
A	4,500	825	831	290	J
B	28,200	824	828	11,420	K
C	1,900	822	826	21,650	L
S	49,700	820	825	8,500	M
D	8,000	819	823	1,900	N
E	16,400	818	820	17,500	O
F	5,400	815	819	3,600	P
G	900	814	818	11,600	Q
H	4,575	812			R

1) Principle: Determining the Maximum Tradable Volume

The principle would establish the price(s) at which maximum tradable volume would be executed. There would be two steps involved in applying this principle.

a. STEP 1 – Determine the Cumulative Buy and Sell quantities at each eligible price. The Cumulative Buy and Sell quantities at each price for ‘XYZ’ are as follows:

b.

BUY		Price	SELL	
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity
0	0	831	290	76,460
0	0	828	11,420	76,170
0	0	826	21,650	64,750
4,500	4,500	825	8,500	43,100



32,700	28,200	824	0	34,600
32,700	0	823	1,900	34,600
34,600	1,900	822	0	32,700
84,300	49,700	820	17,500	32,700
92,300	8,000	819	3,600	15,200
108,700	16,400	818	11,600	11,600
114,100	5,400	815	0	0
115,000	900	814	0	0
119,575	4,575	812	0	0

c. STEP 2 – Establish the total tradable volume at each eligible price (i.e. Maximum Quantity which may be traded at that each price). The total tradable volume at a price would be computed as ‘Minimum of Cumulative Buy and Cumulative Sell quantity’ at the respective price. The Maximum Tradable Volume (MEV) for each eligible price is as below:

BUY		Price	SELL		Maximum Executable Volume
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity	
0	0	831	290	76,460	0
0	0	828	11,420	76,170	0
0	0	826	21,650	64,750	0
4,500	4,500	825	8,500	43,100	4,500
32,700	28,200	824	0	34,600	32,700
32,700	0	823	1,900	34,600	32,700



34,600	1,900	822	0	32,700	32,700
84,300	49,700	820	17,500	32,700	32,700
92,300	8,000	819	3,600	15,200	15,200
108,700	16,400	818	11,600	11,600	11,600
114,100	5,400	815	0	0	0
115,000	900	814	0	0	0
119,575	4,575	812	0	0	0

Note: The Maximum Tradable Volume is the highest value amongst 'Maximum Tradable Volume' derived for all price points.

In this example, the maximum quantity that may be traded is 32,700 at prices 820, 822, 823 and 824. Therefore, as per Principle 1, the Prices eligible for Auction Uniform Price Calculation are 820, 822, 823 and 824. The algorithm would eliminate all other price points as the potential Auction Uniform Price. To further narrow the choices for Auction Uniform Price, Principle 2 would be used to determine the Minimum Unbalance level.

2) Principle: Establishing the Minimum Unbalance

The second principle would ascertain the eligible price levels (from prices 820, 822, 823 and 824) at which the Unmatched Quantity is a minimum.

The Minimum Unbalance at each price level is equal to 'Cumulative Buy Quantity – Cumulative Sell Quantity'



BUY		Price	SELL		Maximum Executable Volume	Minimum Unbalance (CBO – CSO)
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity		
32,700	28,200	824	0	34,600	32,700	-1,900
32,700	0	823	1,900	34,600	32,700	-1,900
34,600	1,900	822	0	32,700	32,700	1,900
84,300	49,700	820	17,500	32,700	32,700	51,600

Ignoring the positive and negative signs, the lowest number in the Minimum Unbalance column is 1,900. The minimum Unbalance occurs at prices 822, 823 and 824. Therefore, as per completion of Principle 2, the Prices eligible for Auction Uniform Price Calculation are 822, 823 and 824. The algorithm would further eliminate 820 as Auction Uniform prices and the algorithm would continue to the 3rd step to establish the Auction Uniform Price.

Note: 0 is the lowest Minimum Unbalance Quantity.

3) Principle: Ascertaining where the Market Pressure exists

The third principle should ascertain where the market pressure of the potential Auction Uniform Price prices exists: on the buy or the sell side.

- a. If all the potential Auction Uniform Prices have positive (+) Minimum Surplus then the market pressure is on the BUY side



(Buyer's Market) and the Auction Uniform Price would be highest of the potential Auction Uniform Prices (Assuming that residual BUY pressure would likely cause the price to rise)

BUY		Price	SELL		Maximum Executable Volume	Minimum Surplus (CBO - CSO)	Multiple Minimum surplus with all +ve Surplus, so Buyer's Market and Uniform Price MAX (100,99) = 100
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity			
200	200	100	0	150	150	50	
200	0	99	150	150	150	50	

- b. If all the potential Auction Uniform Prices have negative (-) Minimum Surplus then the market pressure is on the SELL side (Seller's Market) and the Auction Uniform Price should be lowest of the potential Prices (Assuming that residual SELL pressure would likely cause the price to fall)



BUY		Price	SELL		Maximum Executable Volume	Minimum Surplus (CBO – CSO)	Multiple Minimum surplus with all – Surpluses, so Seller's Market and Uniform Price MIN (99,98) = 98
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity			
150	150	99	0	200	150	-50	
150	0	98	200	200	150	-50	

- c. If the potential Auction Uniform Prices have either 'positive (+) as well as negative (-) Minimum Surplus Minimum Surplus' of 'If the Minimum Surplus is zero for each potential Price' then the algorithm should not further eliminated any potential Auction Uniform Prices derived from Principle 2 and should continue to Principle 4 carrying forward all the potential Auction Uniform Prices



BUY		Price	SELL		Maximum Executable Volume	Minimum Surplus (CBO – CSO)
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity		
32,700	28,200	824	0	34,600	32,700	-1,900
32,700	0	823	1,900	34,600	32,700	-1,900
34,600	1,900	822	0	32,700	32,700	1,900

In this example it is not yet possible to calculate as Auction Uniform Prices, since the potential Auction Uniform Prices have positive (+) as well as negative (-) Minimum Surplus. Therefore, at the completion of Principle 3, the Prices eligible for Auction Uniform Price Calculation are 822, 823 and 824 and the algorithm continues to the fourth and final step to establish the Auction Uniform Price.

4) Principle: Average of Price Points having Minimum Unbalance

The fourth and final principle determines Auction Uniform Price from the range of prices established in Principle 3 (from prices 822, 823, 824).

There are two steps to this Principle. The first step should be to narrow the options of potential Auction Uniform Prices to 2 potential Auction Uniform Prices from within the derived price range



a. STEP 1

I. If the result of Principle 3 is a combination of positive and negative Market Pressure, then the algorithm should mark the two prices where the sign changes.

BUY		Price	SELL		Maximum Executable Volume	Minimum Surplus (CBO – CSO)
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity		
32,700	0	823	1,900	34,600	32,700	-1,900
34,600	1,900	822	0	32,700	32,700	1,900

II. If the Minimum Surplus for all potential Auction Uniform Prices is zero, then the algorithm should mark the highest and lowest prices within the potential price range as the potential Auction Uniform Prices.

BUY		Price	SELL		Maximum Executable Volume	Minimum Surplus (CBO – CSO)	Multiple Minimum Surplus with all 0, so Uniform Price AVG (110, 105) = 107.50
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity			
1000	1000	110	0	1000	1,000	0	
1000	0	105	1000	1000	1,000	0	



In this example the sign at 822 is positive and changes to negative to 823. Therefore, the algorithm chooses 822 and 823 as the potential Auction Uniform Prices to be applied in this principle.

b. STEP 2

The Auction Uniform Price should be defined as the average of 2 derived potential Auction Uniform Prices i.e. 822 and 823. Auction Uniform Price = $AVG(822,823) = 822.50$

The determined official Auction Uniform Price would be '**822.50**'

Note: if determined Auction Uniform Price is not as per Product's Price Tick then Auction Uniform Price would be rounded off to the nearest product's price tick

All the matching orders would get traded at the Determined Auction Uniform Price, regardless of the price actually stated when placing an order. The Order Priority for matching purpose would be determined on '**Price-Time**' Priority basis. All the Auction Session's Unmatched Pending Orders would get cancelled

Note: If the Auction session has no overlapping Buy and Sell orders (i.e. Trades = 0), then the 'Three step Conditional Decision Rule Approach' to determine 'Auction Uniform Price' would not be referred.



B) Continuous Trade Session

The order matching rules for this trade session will have the following features

- a) In case of continuous market segment the order is immediately checked if it can be matched.
- b) The Orders are matched based on price and time priority. In case of more than one order having the same price, the order with the earlier time will get the priority in matching.
- c) The best buy order is matched with the best sell order when (buy price \geq Sell Price). For order matching, the best buy order is the one with the highest price and the best sell order is the one with the lowest price.
- d) An order may match partially with another order resulting in multiple trades.

6. Margin Requirement

The Members or the Clients, as applicable, participating in Term Ahead Market segment will have to make available the following types of margins to the Exchange from time to time as described below.

- a) **Initial Margin (Operational limit):** Initial Margins have to be submitted to the Exchange by the Member or the Client, as applicable, before start of their trading. Initial Margins will be computed on the total order value. The percentage of the order value required as initial margins shall be defined in the Contract Specification. This initial margin will be blocked



automatically from the total available deposits. The trading system will automatically reject orders in case the initial margin exceeds the balance deposits available. Initial Margins will be released only after such time as defined in the Contract Specification. The release of Margin Funds shall be based on the Members or the Clients, as applicable, request and after adhering to the risk management procedures of the exchange.

- b) **Additional Margin (Basis Margin):** Additional Margin will be computed as a percentage of the traded value as per the risk curve defined and will be collected in different trenches as per the contract specifications. Only the buyer Members or the Client, as applicable, will have to pay the Additional Margin to the exchange based on their trade confirmation. The Member or the Client, as applicable, will have to make available the Additional Margin before the end of the trading day or as may be specified in respective Contract Specification. Unlike Initial Margin which is a pre trade margining system, Additional Margins will be computed on the traded value at client level. This margin will be blocked from the available cash or non-cash collaterals and will be released progressively as per the risk curve defined by the exchange. In case if the Member or the Client, as applicable, fails to bring in the additional margin within the specified period then the trades will be cancelled and penalty will be levied to the member. All other forms of margin collected by the exchange till such time may also be impounded.



- c) **Variation Margin:** The Exchange on a pre-decided day will compute the Variation Margin of members based on their trades (open position). Variation Margin is levied member wise and computed at client level. It is the difference (loss) between the Settlement price and the traded price where the Settlement price is the average price of the last 'N' number of trades on the trading day or the last traded price of the contract having the same underlying delivery period or as decided by the exchange from time to time. In case if there is a profit for a particular client then it will not be credited to the member, neither will it be adjusted against any other losses at client level or at member level. In case if the Member fails to bring in the variation margin till the next working day then the trades may be cancelled and the Exchange at its own discretion impose penalty on the member. All other forms of margin collected by the Exchange till such time, may also be impounded.
- d) **Extreme loss Margin:** The Exchange may collect any ad hoc margins from time to time in case if it feels that the available margins collected by the exchange are inadequate due to variation in the prices in the Market. Prior intimation of the same will be provided to the Members or the Clients, as applicable,.
- e) Each of the above namely initial margin, additional margin, variation margin and extreme loss margin as the case may be shall be payable and be paid in cash or such non cash security or collateral as the Exchange may notify from time to time.



Refund of Additional Deposit: If there is a surplus deposit lying with the Exchange towards margin, will be refunded to the Member or the Client, as applicable,, on receipt of a written request from the Member for refund.

- f) The Member or the Client, as applicable, will get information regarding additional margin requirement, through file transfer protocol (FTP) at end of the trading session. In case the Member or the Client, as applicable, does not have adequate Cash / Non-cash collaterals, the Member or the Client, as applicable,, at the entire discretion of the Exchange, can be barred from further trading on the Exchange.
- g) The Exchange automatically on its own may not adjust the unutilized additional margin in the DAM segment against the margins applied in TAM segment and vice versa.

7. Risk Management System

- a) At the time of submission of the order, exchange will verify the availability of Initial Margin and the order would be accepted only if sufficient funds are available under this head. Initial Margin shall be in form of cash. Further the orders will not be accepted if earlier calls for additional, variation and extra-ordinary margins, have not been fulfilled. The Members or the Clients, as applicable, will be allowed to take exposure on the initial security deposit as decided by the exchange. Thereby a member can put an order to buy or sell in a contract as per his available exposure with the Exchange. Exchange has the right to give exposure limits based on the bank balance



or available margins of such Member, or Client as the case may be, or both for facilitation of intraday and day ahead contingency products.

- b) Additional Margins in the form of cash / non cash collaterals has to be paid by the buyer member or the Client, as applicable, to the exchange as per the Contract Specification and as per the Trading and Delivery Calendar. In case if the member or the Client, as applicable, fails to bring in the required Additional Margin as per the schedule mentioned, then the Exchange can cancel the trade and may impound the available Initial Margin and Additional Margin and also recover penalty from the member or the Client, as applicable,.
- c) During the entire tenure of the contract, Exchange will monitor traded price of a contract with that of the price of the contract with same underlying traded earlier and in case of change in the Prices between two trading sessions, Variation Margins will be worked out and recovered from the members. Exchange will have the right to collect from its members an ad hoc margin during the tenure of the contract to cover any additional risk arising out of Price Movement in the Market. Types of Financial and delivery defaults and penalties levied thereof:



- 1) Financial defaults can be of two types:
- i. Margin default
 - ii. Funds pay in default

i. Margin default: In case if the seller member fails to bring in the initial margin after the trade for the difference between the order value and the trade value on the traded day, the exchange will withhold the initial margin available with the exchange and impose penalty for amount equivalent to such difference from the other available margins of the member or the Client, as applicable,. Similarly, the exchange will cancel the trade in case if the member or the Client, as applicable, fails to pay Basis margin or Variation margin as per the schedule. All the margins collected from such member or the Client, as applicable, will be withheld. The non-cash collateral will be liquidated and passed on to the counter party. Apart from the above, exchange will also collect difference between the higher of the traded price or the settlement price for that contract on its platform. Similarly in case if a member fails to pay Extreme loss margins demanded by the exchange, the exchange will have the right to take all the above mentioned actions against the member or the Client, as applicable.



ii. Funds pay in default: In case if the buyer member or the Client, as applicable, fails to make good the funds pay in on any of the pay in day, the Exchange will be at liberty and has the power and discretion to cancel the allocation of its trades and initiate appropriate action against such Member or the Client, as applicable,. The total margins

collected till that period will be withheld and sent for liquidation. Apart from the above, exchange will also collect difference between higher of the traded price or the settlement price for that contract on its platform.

2) Delivery defaults can be of following types:

Failure to receive SLDC clearance: In case, the exchange does not receive the SLDC clearance as per the scheduled time from the member, then 5% of the total trade value or the total settlement value (trade quantity * settlement price), whichever is higher will be collected from the defaulting member. Penalty so collected shall be passed on to the counter party after deducting administrative charges for the exchange which will be 5% of the penalty amount. subject to maximum of Rs. 10,000 (including taxes). In case if the member fails to make good the penalty amount in his settlement account, the non cash collateral available with the exchange shall be liquidated.

Failure in Seller's ability to deliver: In case of failure in delivery by Seller, the difference between the traded quantity and actual delivery is settled under UI.



A 15% deviation for the RE Seller in the quantum of generation traded in energy terms and Generation Schedule provided on D-1 basis is permissible.

Revision of Schedule: Once the trade has been scheduled for delivery, no revision shall be allowed. However, if exchange is satisfied that the revision of schedule is necessary because of reasons beyond control and there is no commercial consideration motivating the party requesting for revision, then the following procedure will be adopted:

In case if, a party wants to exit the contract, than he has to deposit amount in cash to the exchange which shall be sum of following elements.

- (i) 125% of the difference between the trade price and the last settlement price of the same underlying.
- (ii) The transmission charges paid by the counter party for the quantum requested for revision.
- (iii) 5% of (i) above, as administrative charges for the exchange subject to maximum of Rs.10,000/- (including applicable taxes).

The affected counter party will be credited the difference and the transmission charges.

Exchange will debit the amount from member's settlement account: The effected counter party will be credited the difference and the transmission charges. The exchange, on receipt of amount based on above formula, shall send request for revision of schedule. In the next trading session



when same underlying is traded again, the exchange will check the new settlement price with the amount worked out as at (i) above and make suitable adjustments as under.

Adjustment of amount collected for rescheduling from sellers: In case new settlement price is higher than the previous settlement price and the difference between the earlier collected amount and amount worked out on new settlement price works out to be more than the amount collected as above, and the difference between the earlier collected amount and amount worked out on new settlement price works out to be more than the amount collected as above seller. However, if, the difference works out to be less than the 125 % collected then any excess will be refunded to the seller. But, if the new settlement price is lower than the traded price then entire amount as above will be refunded to the seller. No refund of transmission charges shall be done to the seller will be allowed due to above adjustments.

Adjustment of amount collected for rescheduling from buyers: In case new Settlement Price is lower than previous Settlement Price and is more and the difference between the earlier collected amount and amount worked out on new settlement price works out to be more than the amount collected, then the difference would be additionally collected from the buyer. However if difference works out to be less the 125% collected then any excess will be refunded to the buyer. But, if the new



settlement price is higher than the traded price then entire amount will be refunded to the buyer. No refund of transmission charges to the seller will be allowed due to above adjustments.

In case there is no trading session remaining in that underlying before start of delivery then such working shall be based on the prices of daily contracts which are corresponding to days of such weekly contract. Further, in case no daily contract is available for trading before start of delivery then the working shall be done on the basis of average of hourly prices in the day ahead market (collective transactions). Similarly for working out rescheduling charges for Daily Contracts reference would be taken from the same underlying and in absence of this, basis of working shall be hourly prices in the day ahead market (collective transactions).

The Settlement Prices mentioned above shall be for the regions in which the requesting party is located.

- d) Amount for everyday Pay-in and Pay-out shall be on net basis and the member will be responsible for settling funds obligation between its client's pay-in and pay-out.

8. Surveillance



1. In order to ensure market integrity and to avoid market abuses, the Exchange will use various on-line and off-line surveillance tools.

The Exchange shall have the right to take appropriate actions in such cases, which are discussed as under.

2. **Validation of orders:** Members are required to ensure that bids and offers are in conformity with relevant regulatory provisions. In order to avoid any abnormal orders being put by the Exchange Members like high bid price or bid quantity, the Exchange will validate such orders either through software or manually on a daily basis, wherever possible. Further, the order value of the Member will also be compared with the available limits of such Member for any over utilization. Members are required to ensure that the bids are for the quantity registered with the Exchange for trading which shall be on the basis of their capacity to arrange open access from their respective SLDC. In case the quantity is beyond the above limits, then Exchange will have right to cancel or modify one or more order.
3. **Price movement:** The Exchange will observe any variation in prices as compared to past data. Further, the price movement in the Exchange shall be correlated with that of the bilateral markets that is available with the Exchange.
4. **Market behavior:** The Exchange shall compare the trend in other national or bilateral markets with that of the Exchange. Any unwarranted change in the price pattern or order trend in this will be brought under the notice of the Exchange management.
5. **Correlation with Unscheduled Interchange (UI):** The trend in the UI rate and the prices in the Exchange shall be compared for any major differences. In case of individual Member its trend of trading on the Exchange shall also be compared with his UI obligations.



6. **Price rigging, concentration, price manipulation and other market abuses:** The Exchange will monitor concentration, price rigging, price manipulation and other market abuses and take suitable actions whenever such practices are identified.

9. Delivery procedure

Delivery procedure will be different for National and Regional Contracts.

National and Regional Contracts

- i. All Contracts (trades) shall be for delivery of power as per the requisition submitted by the Exchange and scheduled by NLDC / RLDCs / SLDCs.
- ii. Delivery Point: The delivery point of all the contracts shall be at the Seller's Regional Periphery as per Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 as amended from time to time..
- iii. After finalization of successful trades, the exchange will send details to both the counter parties to obtain concurrence from their respective SLDC. The participants would be required to submit these concurrences in the prescribed Format in accordance with the 'Procedure for Scheduling of Bilateral Transactions' and as specified in the Calendar. Exchange will make application for transmission capacity reservation and advance scheduling as per the schedule mentioned in the Calendar. In case if the "Concurrence from SLDC" received from both the parties does not match with each other, the Exchange will consider the minimum of the quantity mentioned for sending the application



for scheduling only if the quantity is same for all the traded hours. In all other cases where there is mismatch in hours and / or in quantity cleared in the SLDC concurrences, the contract will be liable to made void.

- iv. The Buyer shall accept the decision on routes that may be available to carry the power without any reservation. Buyer will be deemed to have consented for all possible routes for delivery of the power, however, they can give preference amongst the possible routes along with the concurrence. In absence of any preference from the buyer, the Exchange at its absolute discretion, can decide the route through which application is to be made and also the alternate routes to be mentioned in such application.
- v. Nodal RLDC's acceptance for scheduling will be binding on both buyers and sellers. In case of anticipated congestion in one or more transmission corridor, the Exchange will have the right to participate in the electronic bid on behalf of the Members as per the guidelines laid down in the 'Procedure for Scheduling of Bilateral Transactions'. Trade once executed shall not be revised except as provided in the Contract Specification and shall be sent for reservation of transmission capacity and advance scheduling as per the Trading and Delivery Calendar. The schedule shall not be revised during the delivery period except as provided in the Contract Specification.
- vi. Any shortage or excess delivery of electricity from the total schedule will be settled by the respective participants under UI mechanism as per the procedure laid down by the CERC or any other settlement system as prescribed by concerned SERC.



- vii. Taxes, duties, cess and other levies: The price of all the Contracts shall be quoted at delivery point excluding the transmission charges, losses, scheduling and system operation charges, taxes, duties, cess, surcharge and other levies and the same shall be borne by the Buyers or Sellers as applicable.
- viii. Metering of electricity: Arrangement for metering shall be made by the Seller/Buyer as per the requirements of respective SLDC / RLDC. Members and the relevant authority shall be responsible to resolve the issues related to metering of electricity. Members shall indemnify and keep indemnified the Exchange from any disputes related to metering.
- ix. Transmission Losses: Seller shall bear in kind the transmission/distribution losses from its own interface up to the delivery point. Buyer shall be required to bear in kind all the transmission/distribution losses from the delivery point up to its own interface. Transmission loss percentage for the respective transmission system as applicable at the time of actual delivery shall be applied for deriving scheduled quantities at various points in the transmission route in accordance with the Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time.
- x. Transmission Charges: All the transmission charges shall be calculated on the total quantum of power scheduled at seller's Regional Periphery. Seller shall pay for the transmission charges and Wheeling Charges (wherever applicable) up-to the point of delivery and Buyer shall bear all the charges for enroute regional



transmission system and also the transmission and wheeling charges (wherever applicable) for its respective State grid in accordance with the Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time..

- xi. Scheduling and Operating charges: Seller will pay for the Scheduling and Operating charges upto delivery point i.e. for the concerned RLDCs /SLDCs /ALDCs involved in transaction. Buyer will bear all the Scheduling and Operating charges from its interface up to delivery point i.e. for the concerned RLDCs /SLDCs /ALDCs involved in transaction. Application fees for the Nodal RLDC will be paid by the buyer.
- xii. All Transmission, Wheeling charges, Scheduling, Operating charges and application fees will be paid to the Nodal RLDC as per advice received from them and the same will be recovered from the buyers and sellers.
- xiii. The Application fee for processing the 'Concurrence from SLDC' shall be paid by Buyer and Seller for their respective SLDCs.
- xiv. **E bidding consent:** In the event, it is reiterated that the implementation of the contract finalized between the Buyer and the Seller through Power Exchange shall be subject to the availability of the transmission capacity and constraints in the system. In the event of anticipated congestion in one or more transmission corridor and a need for participating in the e-bidding for securing transmission corridor as per the guidelines laid down



in the procedure for scheduling of bilateral transaction, the following shall apply:

- a) The Exchange will have the right to participate in the e-bidding on behalf of the Members as per the above guidelines for bilateral transactions;
- b) In case of more than one transaction contracted through the Exchange, the Exchange will have the right to participate in the e-bidding for both the transactions;
- c) Each of the Buyer participating in the transaction through the Exchange shall notify to the Exchange the maximum transmission charges for which the Exchange can bid on his behalf.
- d) In case any of the Buyer participating in the Exchange is not willing to give consent for e-bidding, there will be an automatic reduction in the contracted quantity for such Buyer and the schedule for dispatch of the related quantum affected by the anticipated congestion may not be implemented, although the Exchange will forward to the concerned RLDC the request for scheduling subject to the availability of the transmission capacity;
- e) In case the Buyer notifies the maximum transmission charges to which they are agreeing to pay, the Exchange will participate on behalf of the respective Buyer in the e-bidding up to the same limit;
- f) The decision on the person entitled to the transmission corridor based on e-bidding taken by the concerned RLDC shall be binding on the parties.



10. Transaction fees

The Exchange will charge a transaction fee, as may be specified by the Exchange from time to time, on the transactions carried through the Exchange. Such transaction fee will be computed on value basis or volume basis, as may be decided from time to time, which will be computed on both purchases and sales separately.

11. Reports

- I. After end of trading session, the Exchange will download the reports to the Members which consist of Trade file Report, Provisional Obligation Report, Final Obligation Report and other relevant matters.
- II. Based on the Exchange's Reports, the Members can inform their Clients about their successful trades along with their obligation.



Annexure E-1

S. No.	Item	Details
1	Contract Name	Green Day-Ahead Contingency Contracts (Solar/ Non-Solar)
2	Contract Code	“Type of Contract- Time block” E.g.(GDACSL-01) or (GDACNS-01) Where, GDAC: Green Day Ahead Contingency contracts SL: Solar NS: Non-Solar 01:Time block number 1, starting from 00:00 hours to 00:15 hours
3	Contract Type	Delivery Option - Firm Delivery
4	Contract available for Trading	15 mins contracts for next day from 1 st time block to 96 th time block i.e. 96 contracts of 15 mins each.
5	Trading day	A day before delivery day or as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids.
8	Matching of Bids	Continuous trade session. Details in clause 5 (B) of Schedule B of Business Rules. Each trade will be sent for scheduling, on trade to trade basis.
9	Trading Hours	Continuous trade session: 03.00 PM to 11.00 PM on trading day i.e. one day before delivery date or as per trading calendar
10	Minimum Volume quotation	1 MW
11	Minimum Volume	1 MW



	Step	
12	Lot size	1 MW * 15 mins
13	Maximum bid size*	Bids should not be more than the allowed MW in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWh (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
16	Volume Tick size	1 MWh
17	Quantity Variation	Zero quantity variation allowed.
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)*	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fee*	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	Delivery shall commence 3 hours after expiry of the contract. Trade once executed shall not be revised and shall be sent for scheduling, and at no point of time during the contract period shall be allowed to be revised. The quantity shall be deliverable as per the schedule issued by the respective RLDC.
22	Delivery period	Delivery for each 15 min time block.
23	Delivery point	The delivery point shall be at Seller's Regional Periphery as per Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses)



		Regulations, 2010 as amended from time to time.
24	Application for Scheduling	Application for Scheduling will be Submitted to Nodal RLDC on Contingency basis as per the "Procedure for Scheduling of bilateral transactions"
25	SLDC Clearance	The buyer and seller will have to take concurrence from their respective SLDC for scheduling of Power. This concurrence has to be submitted as per the timelines specified in the Trading and Delivery Calendar. NOC / Prior Standing Clearance issued by the SLDC in format PX-I as per CERC (Interstate Open Access) Regulations, are also valid for these transactions.
26	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
27	Alternate route	Unless preference is specified by the buyer, he will be deemed to have consented for all possible transmission corridors from seller's injection point till drawal point.
28	Force majeure	In case of force majeure, the Exchange will settle the contract as per final schedule issued by RLDCs.
29	Fines & penalties*	As decided by the Exchange from time to time and informed through circular.
30	Payment of Application fees, Transmission &	Application fees, Transmission and Operating Charges as applicable on quantum scheduled at the delivery point



	Operating Charges by Members	and payable to the Nodal RLDC, will be recovered from the buyer and seller members on receipt of acceptance from the nodal RLDC.
31	Funds pay in by Members	Exchange will debit/adjust the funds pay-in on the day of trade from buyer's member /clients, as applicable. Excess margins, if any due to partial concurrence received will be refunded back to the member on the settlement day.
32	Funds pay out to Members	Exchange will credit the funds pay out in seller's member's settlement account on D+1 basis at 12.00 noon for each delivery day subject to confirmation of delivery pay in by the seller.
33	Continuous Trade Session (Daily)	1500 – 2300
34	SLDC Clearance and Declaration Form sent to Members	As specified in G-TAM Trading and Settlement Calendar
35	Submission of SLDC Clearance to the Exchange by the Member	As specified in G-TAM Trading and Settlement Calendar
36	Submission of Application to Nodal RLDC	As per Procedure for scheduling of Bilateral transactions
37	Approval from nodal RLDC	As per CERC Order dated 08.04.2015 in Petition no. 006/SM/2015.
	Pay in/ adjustment on T+1 basis where T is the trading day	Post receipt of nodal RLDC approval
	Payout on T+2 basis where T is the trading day	By 1100
38	Payment of charges to Nodal RLDC as per Procedure for Scheduling of	1500



	Bilateral Transaction.	
39	Application for Scheduling will be sent only when the SLDC Clearances from buyer and seller are received by the Exchange. In case, the SLDC approval is not received from SLDCs of buyer/ seller as specified in Trading and Delivery Calendar, then it will be considered as default by buyer/seller.	



Annexure E-2

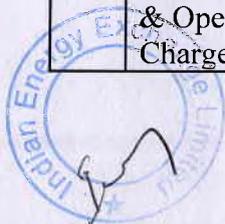
S. No.	Topic	Details
1	Contract Name	Green Intra Day Contracts (Solar/ Non-Solar)
2	Contract Code	“Type of Contract- “Time block No.” (E.g.GITDSL-01) (E.g.GITDNS-01) Where, GITD: Green Intraday Contracts SL: Solar NS: Non-Solar 01:Time block number 1, starting from 00:00 hours to 00:15 hours
3	Contract Type	Delivery Option - Firm Delivery
4	Contract available for Trading	15 mins contracts for next day from 1 st time block to 96 th time block i.e. 96 contracts of 15 mins each.
5	Trading day	Every calendar day of the year for same delivery date.
6	Trading Session	Continuous Trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids.
8	Matching of Bids	Continuous trade session: Details in clause no. 5 (B) of Schedule B of Business Rules. Each trade will be sent for scheduling, on trade to trade basis.
9	Trading Hours	Continuous trade session: 0030 hrs to 2000 hrs on trading days
10	Minimum Volume Quotation	1 MW
11	Minimum Volume Step	1 MW



12	Lot size	1 MW*15 mins
13	Maximum bid size	Bids should not be more than the allowed MW in any of Concurrence/clearance issued by its SLDC to the members/clients at any time. It will be the responsibility of the member to adhere to this rule.
14	Price Quote Basis	Rs. per MWh (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
16	Volume Tick size	1 MWh
17	Quantity Variation	Zero quantity variation allowed.
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.
20	Transaction Fees	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Continuous Trade Session (Daily)	0030 hrs to 2000 hrs
22	Delivery	Delivery shall commence 3 hours after expiry of the contract. Trade once executed shall not be revised and shall be sent for scheduling, and at no point of time during the contract period shall be allowed to be revised. The quantity shall be deliverable as per the schedule issued by the respective RLDC.
23	Delivery period	Delivery for each hour.



24	Delivery point	The delivery point shall be at Seller's Regional Periphery as per Procedure for Scheduling of Bilateral Transaction and Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time.
25	Application for Scheduling	Application for Scheduling will be Submitted to Nodal RLDC on Contingency basis as per the "Procedure for Scheduling of bilateral transactions".
26	SLDC Clearance	The buyer and seller will have to take concurrence from their respective SLDC for scheduling of Power. This concurrence has to be submitted as per the timelines specified in the Trading and Delivery Calendar. NOC / Prior Standing Clearance issued by the SLDC in format PX-I as per CERC (Interstate Open Access) Regulations, are also valid for these transactions.
27	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
28	Alternate route	The buyer will be deemed to have consented for all possible routes; however, they can give preference amongst the possible routes.
29	Force majeure	In case of force majeure, the Exchange will settle the contract as per final schedule issued by RLDCs.
30	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
31	Payment of Application fees, Transmission & Operating Charges by	Application fees. Transmission and Operating Charges as applicable on quantum scheduled at the delivery point and payable to the Nodal RLDC will be recovered from the buyer and seller members on receipt of the acceptance from the nodal RLDC.



	Members	
32	Funds pay in by Members	Exchange will debit/ adjust the funds pay-in on the next day of trading from buyer's member/ clients as applicable. Excess margins, if any due to partial concurrence received will be refunded back to the member on the settlement day.
33	Funds pay out to Members	Amount equivalent to net obligation will be credited at 12.00 noon on T+1 basis (where T stands for Trading day.)
34	Continuous Trade Session (Daily)	0030 hrs to 2000 hrs
35	SLDC Clearance and Declaration Form sent to Members	As specified in G-TAM Trading and Settlement Calendar
36	Submission of SLDC Clearance to the Exchange by the Member	As specified in G-TAM Trading and Settlement Calendar
37	Submission of Application to Nodal RLDC	As per Procedure for Scheduling of Bilateral Transaction.
38	Approval from nodal RLDC	As per CERC Order dated 08.04.2015 in Petition no. 006/SM/2015.
39	Payin /adjustment on T+1 basis where T is the trading day	Post receipt of nodal RLDC approval
40	Payout on T+2 basis where T is the trading day	By 1100



41	Payment of charges to Nodal RLDC as per "Procedure for Scheduling of Bilateral Transaction".	1500
42	Application for Scheduling will be sent only when the SLDC Clearances from buyer and seller are received by the Exchange. In case, the SLDC approval is not received from SLDCs of buyer/seller as per specified in Trading and Delivery Calendar, then it will be considered as default by buyer/seller.	



Annexure E-3

S. No.	Item	Details
1	Contract Name	Green Daily Contracts
2	Contract Code	“Type of Contract- Day No.” (E.g.GDYSL-DDMM) (E.g.GDYNS-DDMM) Where, GDY: Green Daily Contracts SL: Solar NS: Non-Solar DD: Day MM: Month
3	Contract Type	Delivery Option - Firm Delivery subject to a downward variation up to 15% of Energy Traded
4	Contract available for Trading	Energy in terms of MWhr to be supplied on the day according to generation schedule provided by supplier on D-1 basis
5	Trading day	Trading will be available on all days as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids and matching shall take place on Price-Time



		priority basis.
8	Matching of Bids	Through a continuous trade session.
9	Trading Hours	Continuous trade session: 01.00 PM to 05.00 PM on trading day or as per trading calendar.
10	Minimum Volume quotation	1 MWhr
11	Volume Tick size	1 MWhr
13	Maximum bid size	Bids should not be more than the allowed MWhr in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWhr (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
17	Quantity Variation	Downward variation up to 15% of Energy Traded. .
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (105% margin from buyers of the total order value should be available in cash with the



	Operational Limit)	exchange at the time of bidding for continuous trading sessions.
20	Transaction Fee	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	The quantity shall be deliverable as per the schedule issued by the RLDC.
22	Delivery Point	At the Regional periphery.
23	SLDC Clearance	After trading on the exchange, the buyer and seller will have to take a concurrence of their respective SLDCs. This concurrence has to be submitted to the exchange as per the timelines specified in the trading and delivery calendar.
24	Application for scheduling	Application for Scheduling will be submitted to Nodal RLDC as specified in the Trading Calendar and as per the "Procedure for scheduling of bilateral transactions".
25	Delivery Process	Application for scheduling, as specified in the trading and delivery calendar shall be sent to the Nodal RLDC for Contingency transactions as per the "Procedure for scheduling of bilateral transactions".
26	Application fees, Operating and	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery



	Transmission Charges and Losses	point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied on the quantum of power scheduled at seller's Regional Periphery.
27	Force majeure	In case of force majeure the Exchange will settle the contract as per final schedule issued by RLDCs.
28	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
29	Submission of SLDC Clearance to the Exchange by the Member	Along with Generation Schedule on D-1 basis or as specified in GTAM Trading and Settlement Calendar
30	Payment of Application fees, Transmission & Operating Charges by Members	Application fees will be collected from buyer on date of application to Nodal RLDC. Transmission and Operating Charges as applicable on quantum scheduled at seller's periphery and payable to the Nodal RLDC, will be recovered from the buyer and seller members on the next day of receiving the acceptance from the nodal RLDC.



31	Funds pay in by Members	Exchange will debit the funds pay-in on each D-1 basis at 11.00 am from buyer's member's settlement account.
32	Funds pay out to Members	Exchange will credit the funds pay-out in seller's member's settlement account on D+1 basis at 12.00 noon subject to confirmation of delivery pay in by the seller.



Annexure E-3

S. No.	Item	Details
1	Contract Name	Green Weekly Contracts
2	Contract Code	“Type of Contract- Day No.” (E.g.GWKSL-MMWN) (E.g. GWKSL-MMWN) Where, SL: Solar NS: Non-Solar WN: Week Number MM: Month
3	Contract Type	Delivery Option - Firm Delivery subject to a downward variation up to 15% of Energy Traded
4	Contract available for Trading	Energy in terms of MWhr to be supplied on all days of the week (Monday to Sunday) according to generation schedule provided by supplier on D-1 basis.
5	Trading day	Trading will be available on all days as per trading calendar declared in advance.
6	Trading Session	On each trading day, one continuous trading session will be made available to the members for bidding.
7	Bidding process	Seller will submit sell bid for the contract. Whereas a buyer will submit buy bids and matching shall take place on Price-Time priority basis.



8	Matching of Bids	Through a continuous trade session.
9	Trading Hours	Continuous trade session: 01.00 PM to 05.00 PM on trading day or as per trading calendar.
10	Minimum Volume quotation	7 MWhr
11	Volume Tick size	7 MWhr
13	Maximum bid size	Bids should not be more than the allowed MWhr in any of Concurrence/Clearance issued by its SLDC to the Members/Clients at any time. It will be the responsibility of the Member to adhere to this rule.
14	Price Quote Basis	Rs. per MWhr (excluding all fees, charges, taxes, if applicable)
15	Price Tick	Rs. 1 per MWh
17	Quantity Variation	Downward variation up to 15% of Energy Traded. .
18	Settlement	Traded price * Quantity scheduled by RLDC at delivery point.
19	Initial Margins (Operational Limit)	105% margin from buyers of the total order value should be available in cash with the exchange at the time of bidding for continuous trading sessions.



20	Transaction Fee	Fees payable by buyer and seller to Exchange for the quantity approved by nodal RLDC at delivery point as specified by the exchange from time to time.
21	Delivery	The quantity shall be deliverable as per the schedule issued by the RLDC.
22	Delivery Point	At the Regional periphery.
23	SLDC Clearance	After trading on the exchange, the buyer and seller will have to take a concurrence of their respective SLDCs. This concurrence has to be submitted to the exchange as per the timelines specified in the trading and delivery calendar.
24	Application for scheduling	Application for Scheduling will be submitted to Nodal RLDC as specified in the Trading Calendar and as per the "Procedure for scheduling of bilateral transactions".
25	Delivery Process	Application for scheduling, as specified in the trading and delivery calendar shall be sent to the Nodal RLDC for Contingency transactions as per the "Procedure for scheduling of bilateral transactions".
26	Application fees, Operating and Transmission Charges and Losses	Seller will bear all the Transmission, Scheduling & Operating charges and Transmission Losses (in kind) up to the delivery point and Buyer shall bear all the Transmission, Scheduling & Operating charges including Application Fees and Transmission Losses from delivery point up to their point of drawl . The charges shall be applied



		on the quantum of power scheduled at seller's Regional Periphery.
27	Force majeure	In case of force majeure the Exchange will settle the contract as per final schedule issued by RLDCs.
28	Fines & penalties	As decided by the Exchange from time to time and informed through circular.
29	Submission of SLDC Clearance to the Exchange by the Member	Along with Generation Schedule on D-1 basis or as specified in GTAM Trading and Settlement Calendar
30	Payment of Application fees, Transmission & Operating Charges by Members	Application fees will be collected from buyer on date of application to Nodal RLDC. Transmission and Operating Charges as applicable on quantum scheduled at seller's periphery and payable to the Nodal RLDC will be recovered from the buyer and seller members on the next day of receiving the acceptance from the nodal RLDC.
31	Funds pay in by Members	Exchange will debit the funds pay-in on each D-1 basis at 11.00 am from buyer's member's settlement account.
32	Funds pay out to Members	Exchange will credit the funds pay-out in seller's member's settlement account on D+1 basis at 12.00 noon subject to confirmation of delivery pay in by the seller.

