

KARNATAKA ELECTRICITY REGULATORY COMMISSION

6th & 7th Floor, Mahalaxmi Chambers

No.9/2, M.G.Road, Bangalore – 560 001.

DISCUSSION PAPER ON 'WHEELING AND BANKING CHARGES' FOR RENEWABLE POWER PROJECTS'

I. Preamble

1. The Commission, under the provisions of the Electricity Act, 2003, has issued the KERC (Terms and Conditions for Open Access) Regulations, 2004. Clause 11 of the said Regulations specifies the Open Access Charges which, among other things, include Transmission charge, Wheeling charge and Cross subsidy surcharge. Accordingly, the Commission had determined the Transmission charge, Wheeling charge and Cross subsidy surcharge for Open Access transactions vide its Order dated 9th June 2005. In the said Order, the Commission had observed that the RE based projects cannot compete with conventional sources of energy and therefore, decided to continue concessional wheeling charges. Thus the Commission determined the Wheeling charges for renewable energy sources at 5% and Banking charges [only for Wind and Mini-hydel projects] at 2% of the energy injected and decided that other than these charges, RE Projects shall not be liable to pay any transmission charges or wheeling charges either in cash or kind. The Order also specified that the banking facility in respect of Wind and Mini-hydel projects is to be allowed subject to payment of difference of unscheduled interchange [UI] charges between the time of injection and the time of drawal of power.
2. The Commission, vide its Order dated 11.7.2008 had approved the standard 'Wheeling and Banking Agreement' for RE projects. The above Order was valid for a period of five years from 11.7.2008 i.e., for RE projects commissioned between 11.7.2008 to 10.7.2013. In the said Order, the Commission had continued the 5% Wheeling charges and 2% Banking charges for the RE sources (Banking only for Mini-hydel and Wind Projects). The Order also specified that these charges shall be applicable to the Projects for a period of 10 years from the date of commercial operation of the projects.
3. In the meanwhile, the Commission on 20.06.2013 issued a Discussion Paper, proposing to:

(a) Levy Wheeling and Banking charges on all renewable sources of the State, on par with the charges applicable to non-RE generating Companies and

(b) Discontinue the annual banking facility and to introduce monthly banking, with the excess of energy remaining at the end of the month to be purchased by the ESCOMs at 85% of generic tariff or at APPC fixed by the Commission.

The Commission, after receiving the comments from the stake-holders on the above Discussion Paper and also after hearing the stake-holders on 04.09.2013, passed the Order on 9th October 2013, deciding as under:

(i) The Wheeling and Banking charges fixed in the Commission's Order dated 09.06.2005 and continued thereafter, including in the Commission's Tariff Order dated 06.05.2013, shall continue till 31.03.2014, in respect of RE generators, except captive generators opting for participation in the REC mechanism.

(ii) Captive Generators who desire to avail of the benefit of Renewable Energy Certificate [REC] mechanism, shall be entitled to exercise an option to that effect. On exercise of such an option, they shall be liable to pay the normal transmission, wheeling and other charges as determined in the Tariff Orders in force. They shall be allowed banking facility, which shall be on a monthly basis instead of annual basis, as proposed in the Commission's Discussion Paper dated 20.06.2013 referred to above. The excess energy injected at the end of each calendar month shall be deemed to have been purchased by the Distribution Licensee of the area where the generator is situated and shall be paid for at the APPC rate determined by the Commission from-time-to-time.

In the said Order, the Commission had also noted that:

a. Captive Generators opting for REC, cannot have both concessional W& B charges and the REC benefit and therefore, such power plants have to pay normal charges.

b. The ESCOMs have not furnished details for the adverse impact of existing Wheeling and Banking charges on their finances and that any change in Wheeling and Banking charges already determined requires deeper examination of the facts, material and circumstances prevailing in the State besides the financial impact of the same both on the Generators and Utilities. The Commission

also stated that the Order shall not bar the ESCOMs from filing application for re-fixing the W & B charges or doing away with annual banking facility by filing proper petition.

4. Further, the Commission, vide Order dated 10.07.2013 extended the validity of the Order No. B/01/1 dated 11.7.2008 in the matter of 'Wheeling and Banking Agreement' for a period of three months up to 10.10.2013. The above Order was further extended vide Order dated 10.10.2013, from 11.10.2013 to 31.03.2014 and vide Order dated 24.04.2014, extended the validity for a further period up to 30.6.2014 or till the date of issue of a revised Order in the matter, whichever is earlier. The same was reiterated in the Tariff Order-2014 issued on 12.05.2014.
5. Meanwhile, the Commission in respect of solar power projects issued Tariff Order on 10.10.2013, wherein the Commission exempted solar power projects selling electricity within the State from wheeling & banking charges and cross subsidy surcharge, keeping in view the high cost of generation from solar power plants.
6. Subsequently, the Commission issued a Discussion Paper in the matter of wheeling and banking charges on 11.06.2014, inviting views/suggestions/comments from interested persons and stakeholders on the following issues:

[1] Whether the existing wheeling charges at 5% and banking charges at 2% (banking in the case of wind and mini hydel only) need to be continued for some more time and if so, for how many years? Or should the existing charges be continued till the total installed capacity of wind and mini hydel put together in the State reaches any quantitative target of installed capacity of say 5000 MW or 6000 MW?

[2] In case the wheeling and banking charges are to be revised, should it be gradually increased i.e., from the existing wheeling charges at 5% and banking charges at 2% to wheeling charges of 7% and banking charges of 3% in the FY-15 and wheeling charges of 9% and banking charges of 4% respectively, in the FY16 or the FY17?

[3] Whether to have quarterly banking facility instead of the existing annual banking facility for wind and mini hydel sources, excluding captive Generators opting for the REC mechanism? (That is, energy banked during a quarter has to be utilized in the same quarter).

[4] Whether the banked energy remaining unutilized by the designated consumer at the end of each quarter or year is to be paid for by the ESCOM where the Generator is located and if so, whether 85% of the generic tariff determined by the Commission to the relevant category of consumer is reasonable?

[5] Whether the energy drawal in any month or quarter by consumers under WBA be restricted and if so, whether it is reasonable to restrict such drawal to 10 or 11% (in a month) or 33% (in a quarter) of the annual energy estimated to be injected by the RE Generator opting for wheeling? Alternatively, whether such restrictions should be only during the peak months of December to May?

[6] If the charges are revised, whether the same are to be made applicable to the existing Wheeling and Banking Agreements also?

The Commission in the said Discussion Paper had proposed to continue the concessions extended for solar projects as per the Order dated 10.10.2013., keeping in view the prevailing cost of solar power generation.

The Commission in the above Discussion Paper had observed that:

a. The loss due to concessional wheeling and banking charges is being absorbed by the electricity consumers of the State.

b. The inherent technical losses of 9% up to HT- level [transmission loss of 3.81% and distribution loss of 5.20% considering the State as a whole] are not covered by the 5% energy charge levied as wheeling charge.

c. It is desirable that mature technologies like wind, mini-hydel, Biomass and Co-generation, in the long run, have to bear the transmission and wheeling charges on par with electricity generated from conventional sources of energy. However, this transition should be gradual, as otherwise, it would affect the investments in the RE generation in the State. The Commission therefore, proposed to levy at least the technical losses which are inherent in the system to the RE generators.

d. Regarding the banking, the ESCOMs have contended that the drawal of banked energy during peak months of December to May would result in increased burden on them to manage the system, due to non-availability of corridors to procure power to meet the demand of their own consumers and that of consumers under WBA, in

addition to high cost of procuring such power. Therefore, it would be desirable to have quarterly banking instead of yearly banking and also having some restrictions on the quantum of energy drawn during a month.

The Commission held hearing in the matter on 25.06.2014 and after considering the comments / suggestions / objections from interested persons and the general public, decided as follows in its Order dated 04.07.2014:

- (1) **The Wheeling charges shall be 5% of the injected energy for wind, mini-hydel, Bagasse based co-generation plants and Biomass based projects;**
- (2) **The banking charges shall be 2% of the injected energy and shall be applicable for wind and mini-hydel projects only;**
- (3) **The annual banking facility is continued for non-REC wind, mini hydel and solar energy projects and henceforth the banked energy unutilised at the end of the wind year, water year or financial year, as the case may be, shall be deemed to have been purchased by the Distribution Licensee of the area where the generator is located and shall be paid for at 85% of the generic tariff determined by the Commission in its latest orders in case of wind, mini-hydel and solar projects. The Commission decides to discontinue the differential UI charges payable, to account for the difference in the power purchase cost between the time of injection and drawal, for both existing as well as new projects utilizing the banking facility;**
- (4) **These charges shall be applicable for the above mentioned renewable energy projects wheeling energy to consumers within the State of Karnataka and commissioned on or before 31.3.2018 and shall be valid for a period of 10 years from the date of commissioning of the project or units;**
- (5) **For REC route captive power plants, the wheeling and banking charges as specified in the order dated 09.10.2013 shall continue.**

While extending the concessional wheeling and banking charges, the Commission, in the above Order had opined as under:

- i. Determination of Wheeling charges depend upon the impact on Investments in the RE sector and impact on end consumers

- ii. The RE plants being small in capacity would act as distributed generation, supplying local loads and thereby, reducing long-distance transmission requirements.
 - iii. The Power shortage in the State is expected to continue and keeping the energy security of the State in view, any additional generation from the RE would be advantageous.
 - iv. Many States have extended concessional transmission, wheeling and banking facility.
7. Further, the Commission on 08.07.2014 approved standard wheeling and banking agreement, for both REC and non-REC route RE projects.
8. The Commission also had issued a clarificatory Order on 12.07.2014, with respect to the Orders dated 04.07.2014 and 08.07.2014, as follows:
- 1) The decision of the Commission, in the order dated 04.07.2014 that, the payment by ESCOMs at 85% of the generic tariff for the banked energy unutilized at the end of the wind year, water year or financial year, as the case may be, shall be applicable henceforth for both existing as well as new projects, commissioned on or before 31.03.2018 utilizing the banking facility.
 - 2) The standard wheeling and banking agreement formats approved vide order dated 8th July 2014, shall be applicable to all the agreements to be executed on or after 8th July, 2014.
9. Further, on 18.08.2014, the Commission passed Order specifying the following for the Solar power projects:
- 1. All the solar power generators in the State achieving commercial operation date (CoD) between 1st April 2013 and 31st March 2018 and selling power to consumers within the State on open access or wheeling shall be exempted from payment of wheeling and banking charges and cross subsidy surcharge for a period of ten years from the date of commissioning. This is also applicable for captive solar power plants for self-consumption within the State.

2. The Captive solar power plants opting for Renewable Energy Certificates, shall pay the normal wheeling, banking and other charges as specified in the Commission's Order dated 9th October 2013.

While arriving at the above decision the Commission in the said Order had observed as follows:

- i. The installed capacity of solar is only 41 MW and solar power generation for use by captive and third parties is yet to come up on a large scale and therefore, there is a need to promote solar power for achieving the desired capacity addition.
- ii. The declining trend in the capital cost of solar power projects will result in cost of generation of solar becoming comparable to other renewables in a period of three to four years and the exemption from wheeling and banking charges is relevant only in the context of comparatively high captive of these projects.
- iii. Extending the benefit for an uncertain period may not be justified in view of the declining trend of capital cost

10. The Commission further issued Orders on 21.11.2014 and 26.02.2015 amending certain clauses of the WBA.

11. Considering that the Orders dated 04.07.2014 and 08.07.2014 relating to wheeling and banking charges are valid upto 31.03.2018, there is a need to take a decision on the wheeling and banking charges that would be applicable for both solar and non-solar power projects under non-REC route from 01.04.2018, onwards. Therefore, the Commission is issuing this Discussion Paper with the proposal for revising the wheeling and banking charges, as discussed in the subsequent paragraphs.

II. Need for Revision of Wheeling and Banking Charges:

1. The Commission had extended concessional wheeling & Banking charges keeping in view the following aspects:
 - a. The high cost of generation from the RE sources vis.a.vis the cost of generation from the conventional sources, because of which the RE sources were unable to compete with the conventional sources.

- b. The Demand-Supply position and energy security in the State
 - c. Impact on the RE investments & the impact on end consumers
 - d. Installed Capacity of the Solar Power Plants
 - e. Concessional charges prevailing in other States
2. Regarding the above issues, the present situation has changed considerably as discussed below:
- a. The cost of the RE sources, especially that of the wind and the solar, has reduced considerably. The bid cost for solar and wind, are less than RS.3.00/unit and are below the cost of new conventional thermal power plants that cost more than Rs.5.00/unit. Thus, in the changed scenario, the wind and the solar power projects can compete with the conventional sources of energy, in terms of cost/unit.
 - b. As per the 2015-16 LGBR issued by the CEA, the demand-supply position during the FY15, when the Orders were passed by this Commission extending concessional wheeling and banking charges, indicated peak shortfall of 4.5% and energy shortfall of 4.3% for the Karnataka and peak shortfall of 5.2% and energy shortfall of 4.1% for Southern region and peak shortfall of 4.7% and energy shortfall of 3.6% for the country. However, as per the 2017-18 LGBR, the actuals for the FY-17 indicates peak shortfall of 0.20% and energy shortfall of 0.5% for the Karnataka and peak shortfall of 0.0% and energy shortfall of 0.2% for southern region and peak shortfall of 1.6% and energy shortfall of 0.70% for the Country. Further, the estimates for the FY18 as per the above report indicates that, Peak shortage of 5.4% and energy surplus of 8.1% for the Karnataka, Peak surplus of 1% and energy surplus of 7.4% for the Southern region and peak surplus of 6.8% and energy surplus of 8.8% for the country. Thus, as far as demand-supply position is concerned, the country as well as the State is moving towards power surplus position, from the earlier deficit regime. Thus, there is considerable change in the demand-supply position also.

- c. With the cost of wind & solar reducing drastically, RE sources can compete with the conventional sources of energy. Even the old projects having recovered their investment, would be in a position to compete with the conventional plants. Further, with HT consumers of the ESCOMs being required to cross-subsidize other category of consumers, more and more HT consumers are opting for OA/wheeling, as it would be financially beneficial considering the prevailing tariff in the State. Thus, as there is sufficient demand from HT consumers under OA/wheeling, the RE investments would not get hampered, as long as, the total cost of supplying electricity under OA/wheeling is less than the HT-tariff. On the other hand, with the increased volume of OA/wheeling transactions, the losses incurred due to concessional W&B charges would also increase, which has to be passed on to the consumers of the ESCOMs, thereby, further increasing their tariff. Thus a reasonable increase in wheeling charges would not affect RE investments. On the other hand, if the same is not revised, the consumers have to bear the excess burden on account of current concessional charges extended to RE projects.
- d. The State's installed capacity of solar which was 41 MW, at the time of issue of the Order dated 18.08.2014, has increased to 1698 MW as on November,2017. Further, it is anticipated that by the end of the FY-19 about 6000 MW of Solar capacity would be commissioned, considering the on-going projects and approvals sanctioned. Thus, there would be a substantial increase in the solar capacity in the State when compared to the FY-15.
- e. It is observed that most of the RE rich States have moved from concessional charges to normal wheeling & banking charges. The prevailing W& B charges in some of the States are discussed in the following paragraphs:

A. Tamil Nadu:

a. Solar Tariff Order dated 28.03.2017

TNERC, as a promotional measure, under section 86(1) (e) of the Act, has decided to levy:

- i. 30% in each of the transmission, wheeling and scheduling and system operation charges as applicable to the conventional power to the Solar power.
- ii. The actual line losses in kind as specified in the respective orders of the Commission and as amended from time to time.
- iii. In respect of the plants availing Renewable Energy Certificates (REC), 100% of the respective charges as specified in the relevant orders.

The TNERC in its 2014 Order had decided not to extend the banking of solar power beyond the billing period.

b. Wind order dated 31.03.2016:

The TNERC decided to levy:

- i. 40% in each of the transmission, wheeling and scheduling and system operation charges as applicable to the conventional power to the wind power.
- ii. The actual line losses in kind as specified in the respective orders of the Commission issued from time to time.
- iii. Banking charges at 12% in kind

B. Gujarat:

a. Solar Order dated 17.08.2015

- i. For wheeling of power to consumption site at 66 kV voltage level and above, the wheeling of electricity generated from the Solar Power Generators to the desired location(s) within the State is allowed on payment of transmission charges and transmission losses applicable to normal Open-Access Consumers.
- ii. For wheeling of power to consumption site at a voltage below 66 KV, the wheeling of electricity generated from the solar

power Generators to the desired location(s) within the State is allowed on payment of transmission charges as applicable to normal open-access customers and transmission and wheeling loss @ 7% of the energy fed into the grid. This loss is shared between the transmission and distribution licensees in the ratio of 4:3.

- iii. Wheeling with Injection at 11 kV or above and below 66 kV- As per the scope of the Order, this Clause will be applicable to ground-mounted or rooftop solar plant of capacity between 100 kW and 1 MW, and ground-mounted solar plants of capacity between 1 MW and 4 MW. The wheeling of power generated by such generators to the desired location(s) within the area of same distribution licensee is allowed on payment (in kind) of distribution loss @ 3% of the energy fed in to the grid. The wheeling of power generated by such generator to the desired location(s) within the State but in the area of a different distribution licensee shall be allowed on payment of transmission charges as applicable to normal Open-Access Customers and transmission and distribution loss @ 10% of the energy fed in to the grid. These losses is shared among the transmission licensee and two distribution licensees involved in the ratio of 3:4:3.

- iv. Wheeling with Injection at 415 V or below- As per the scope of the Order, this clause is applicable to rooftop solar installations of capacity between 1 kW and 6 kW feeding at 220 V, 1 ϕ ; and rooftop solar installations of capacity between 6 kW and 100 kW feeding at 415 V, 3 ϕ . Wheeling of power from rooftop solar plants feeding at 415 V is allowed only to the locations within the same distribution licensee and no wheeling charges shall be applicable in such cases. Further, power from rooftop solar plants at 220 V shall not be allowed to be wheeled and will have to be consumed within the same premises.

- v. In addition to the above, if a Solar Power Generator owner desires to wheel electricity to two or more locations, it shall pay INR 0.05 per unit on energy fed in the grid to Distribution Company in whose area power is consumed.

- vi. All solar power projects that are commissioned under captive generating mode and not operating under the REC route or third party sale are eligible for banking of energy for one-month period only. Banking charges not specified in the Order.

b. Wind Order dated 30.08.2016:

1. Third-party sale wheeling:

- i. Wheeling of power for third party from Wind Energy Generator is allowed on payment of transmission charges, wheeling charges & losses of energy fed to the grid, as applicable to normal open access consumers. Set off of wheeled energy at recipient unit(s) shall be carried out in the same 15-minute time block.

- ii. In addition to the above, Wind Energy Generators who desire to wheel electricity to more than one location, has to pay 5 paise per unit on energy fed to the grid to the Distribution Company concerned in whose areas power is consumed in addition.

2. Captive Use wheeling:

- i. Wheeling of power to consumption site at 66 kV voltage level and above: The wheeling of electricity generated from the Wind Energy Generators, to the desired location(s) within the State, is allowed on payment of transmission charges and transmission losses applicable to normal Open Access Consumer.

- ii. Wheeling of power to consumption site below 66 KV voltage level: In case the injection of power is at 66 kV or above and drawl is at below 66 kV , wheeling of electricity generated from wind power projects to the desired location(s) within the State, is allowed on payment of transmission charges and transmission

losses applicable to normal open access consumers and 50% of wheeling charges and 50% of distribution losses of the energy fed into the grid as applicable to normal open access consumers.

- iii. Wheeling of electricity generated by small investor, having only one WEG in the State, to the desired location(s), shall be allowed on payment of transmission charges applicable to normal open access consumer, and transmission and wheeling losses @ 10% of the energy fed to the grid. The above losses are to be shared between the transmission and distribution licensee in the ratio of 4:6.
- iv. In addition to the above, wind energy generators, who desire to wheel electricity for captive use / third-party sale, to more than one locations, he shall pay 5 Paise per unit on energy fed in the grid to the Distribution Company concerned in whose area power is consumed in addition to the above mentioned transmission charges and losses.

3. Banking:

- i. The captive WEGs not registered under REC are eligible for one month banking for the electricity generated during the same calendar month.
- ii. No banking facility available for third-party sale of wind energy and set off will be done in the 15-minute's time block with open access consumer's consumption.
- iii. Banking charges -in kind at 2% of energy banked.

C. Rajasthan:

As per 'Rajasthan Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff for Renewable Energy Sources - Wind and Solar Energy) Regulations, 2014' the charges are as follows for both wind & solar:

- i. **Transmission & wheeling charges:**

In case of third party sale or for captive use both within the State or outside the State, the transmission charges and wheeling charges is recovered in cash and transmission losses and wheeling losses is recovered in kind as under:

- (a) For use of transmission network, transmission charges and losses as determined by the Commission in respect of open access transactions would be applicable.
 - (b) For use of distribution licensee's network, the wheeling charges and losses as determined by the Commission in respect of open access transactions at respective voltage levels at which electricity is supplied, would be applicable.
 - (c) For use of both EHV and distribution network, both transmission and wheeling charges as well as losses, as applicable, is payable.
- ii. **Banking charges** -at the rate of 2% of banked energy in each month in kind.

D. Andhra Pradesh:

- i. As per wheeling tariff for distribution business Order dated 09.05.2014, there is no wheeling charges for wind, mini-hydel and solar during the control period FY15 to FY19.
- ii. As per Amendment to APERC (interim balancing and settlement code) Regulation, 2006 dated 05.01.2016, banking charges are 2% of energy delivered at the point of drawal.

E. Telangana:

- i. In the Tariff Order dated 27.03.2015, TSERC did not exempt any RE source from paying wheeling charges. Subsequently, TSERC passed Orders on 31.12.2016, exempting solar power projects from paying wheeling charges.
- ii. The banking charges as per the 3rd Amendment to interim balancing and settlement code for OA transaction - Regulation,

dated 22.03.2017, is at 2% of energy delivered at the point of drawal.

Thus it is seen that, all the above States except Andhra Pradesh and Telangana (in case of solar), have revised the wheeling charges. We note that APERC has issued the order under MYT in 2014 and therefore might not have proposed any revision during the existing control period.

3. The Commission in its earlier discussion papers/Orders had also observed that:

- i. Extending the benefit for an indefinite period may not be justified.
- ii. The inherent technical losses are not covered by the 5% energy levied as wheeling charge.

In the light of the above, the Commission is of the view that the wheeling charges need to be revised upwards under the changed circumstances.

III. Commission's proposal:

1. Wheeling charges:

- a. **The Commission proposes to levy 25% of the Normal Transmission charges and/or wheeling charges payable in cash, as determined by the Commission in its Tariff Orders issued from time to time, for all the RE sources transmitting/wheeling electricity using the network of transmission licensee/distribution licensee, as the case maybe.**
- b. **In addition to the above, applicable losses, as approved by the Commission from time to time, shall be deducted from the net energy injected to arrive at the quantum of wheeled energy.**

2. Banking Charges:

The Commission proposes to continue banking charges at 2% in kind of the injected energy.

IV. Applicability:

- i. **The Commission proposes to levy the above charges to all the RE projects under non-REC route, which are under the WBA, both existing and new projects.**

- ii. **For REC route projects, the charges as specified in the Commission's Order dated 09.10.2013, shall continue and the banking charges for such projects shall also be at 2% in kind of the injected energy.**

Interested persons may send their written comments/suggestions/views to the Secretary, Karnataka Electricity Regulatory Commission, No.9/2, 6th and 7th Floors, Mahalakshmi Chambers, M.G. Road, Bangalore-560 001, in writing so as to reach him on or before 31.01.2018.

Dated 10.01.2018

Approved by the Commission
Secretary