

- (ii) M/s Hindalco may submit a detailed report on the proposed interlocking facility, and also the procedure proposed for accounting of energy generated from both the 1 MW and 2 MW plants separately, energy availed from KSEB Ltd, energy import through open access etc.
 - (iii) Alternatively, installation of separate net meters for each of the solar units with physical separation of the lines may also be explored and a detailed report submitted
6. In compliance of the direction of the Commission, the petitioner, vide the affidavit dated 27.11.2020, submitted the following:
- (1) A report on the interlocking facility and proposal of accounting of energy.
 - (2) A study report on the effectiveness of PLC based interlock system provided for 1 MW solar plant of HINDALCO Industries by Dr. K. N. Pavithran (Prof. Rtd) and Sri. P.C Rajan Babu (Chief Electrical Inspector Rtd)

However, the petitioner has not impleaded SLDC, ANERT and Electrical Inspectorate.

7. The second hearing on the petition was conducted on 2.12.2020 through video conference. The summary of the deliberations during the hearing is given below:
- (i) Shri. Sajan Poovayya, Senior Advocate, representing the petitioner submitted that the daily order dated 11.11.2020 contained two part, first part being impleading SLDC, Electrical Inspector and ANERT and second part to submit a detailed report on the interlocking facilities and on the procedure to be adopted to account the energy generated from the 1MW and 2 MW plants separately. The petitioner submitted that, impleading the SLDC, ANERT and Electrical Inspector can be done, if found necessary, after appraising the reports submitted by the petitioner and the reports of the independent experts engaged by the petitioner, by the Hon'ble Commission.
 - (ii) The petitioner explained in detail the interlocking facilities provided by them. The petitioner as an EHT consumer, receives power at 110 kV and has two incoming lines tapped from the Kalamassery- Edayar 110 kV feeder. One of the feeders is loaded and other line is kept energised as standby. The 110kV power is stepped down to 11kV and distributed to all load centres of the factory. There are four 11kV feeders from the common 11 kV bus in the 110kV substation. One feeder is for capacitor bank and other three feeders cater to the loads at various load centres.

The solar power from the 1 MW and 2 MW plants is connected to the 11 kV bus. Special Energy Meters are installed for measuring the solar generation from 1 MW and 2 MW plants.

- (iii) The petitioner submitted that, 'the interlocking system provided by M/s Hindalco prevents the export of power from 1 MW solar plant', as brought out in the example below:

“ At an instant 1 MW plant generate 0.75MW and 2 MW plant generate 1.75 MW, the total solar generation is 2.50 MW. If the load requirement of the factory is 2 MW, then 0.5 MW will be exported to grid. If the load of the factory comes down to 0.5MW, which means that the demand is less than the generation from the 1MW plant, the interlocking mechanism will send a signal to the 1 MW plant and it will go to sleep mode. Whenever the factory demand reaches above 1MW, only then the generation from the 1MW starts again from the sleep mode. Thus, the interlocking mechanism ensures that, only if the factory demand is above 1MW, the Solar Plant with 1MW capacity generate electricity.

If the communication from the 1 MW solar generation is lost, then also the inverter will go to the sleep mode. This ensures 100 % reliability of the interlocking facility.

Further, in the event of grid failure, the solar power generation from the 1MW plant goes to sleep mode and will be back only when grid is again established. This is the generally accepted protocol for any grid connected solar plant.

There is no physical separation of energy from the two plants, once both are in operation. Both the solar plants are connected to the grid and the interlocking ensures that the power from the 1MW plant will not go into the KSEB Ltd grid. The request of the petitioner is to account energy generation from 1 MW plant on first charge basis among the two plants.

All the installations of the consumer including solar plants are approved by the Electrical Inspector'.

- (iv) The petitioner further submitted that, they had entrusted two eminent experts in the field Dr. K.N. Pavithran, Prof (Rtd) and Sri. Rajan Babu, Chief Electrical Inspector (Rtd), to study, inspect and test the Programmable Logic Controller (PLC) based interlocking system. Based on their study of the arrangement, they have certified that the PLC based interlocking system installed by the petitioner ensures that there is no export of energy from the existing 1MW solar plant, if the load is below 1MW. This arrangement is well engineered, effective and

reliable and guarantees that no export of power takes place to the grid under any circumstances.

- (v) KSEB Ltd submitted that, they are yet to receive the affidavit dated 27.11.2020 by the petitioner before the Commission. Hence, the respondent KSEB Ltd requested to allow further time to file its comments on the report submitted by the petitioner.

KSEB Ltd further submitted that, Electrical Inspectorate has to certify the safety aspects of the interlocking facilities provided by the petitioner.

- (vi) The Commission clarified during the hearing that, the directions to implead the SLDC, ANERT and Electrical Inspector is issued considering the specific roles and responsibilities and functions of these bodies. As per the provisions of the Electricity Act, 2003, the Electrical Inspectorate is the appropriate authority to certify the safety aspect of the installation and working of the interlocking facilities installed by the petitioner.

8. Subsequently, the petitioner M/s Hindalco, vide the e-mail dated 4th December 2020 submitted that, they are taking steps to implead SLDC, ANERT and Electrical Inspector as parties to the petitioner. The petitioner further requested the following.

“ (i) Permit the Petitioner to convene a meeting of all the Respondents (including those directed to be impleaded) in order to hold discussions and explain the full factual spectrum. In the meeting the Petitioner will make its earnest endeavors to get their questions / concerns addressed.

(ii) Thereafter, the Petitioner will place a copy of the minutes of such meeting for the Hon'ble Commission to consider on the next date of hearing i.e. 06.01.2021.

The petitioner further requested that, in order to enable the meeting, a formal direction may be issued to the parties to hold a formal meeting before the next date of hearing.

The Commission clarified that, if the petitioner desires to conduct a meeting with the respondents including those directed to be impleaded to appraise the interlocking facilities and other aspects of the issues raised in the petition, the same may be conducted at their convenience. It was further directed that the petitioner shall implead the parties concerned as respondents to the petition as directed.

9. Based on the deliberations during the hearing, the Commission, vide daily order dated 10.12.2020 issued the following directions for immediate compliance.
- (1) The petitioner shall implead SLDC, ANERT and Electrical Inspectorate as respondents to the petition for the next hearing of the petition.
 - (2) KSEB Ltd shall, on or before 24th December 2020, submit detailed comments on the report submitted by the petitioner dated 27.11.2020, with a copy to the petitioner.
 - (3) The petitioner M/s HINDALCO shall submit additional details, if any, latest by 30.12.2020.
10. M/s Hindalco Ltd submitted an Interlocutory Application (IA No 13/20) dated 14/12/2020 to implead SLDC, ANERT and Electrical inspectorate as respondents to the petition.
11. The petitioner M/s Hindalco Ltd, on 05.01.2021, submitted a copy of the Minutes of the Joint Virtual Meeting held on 30.12.2020 between the petitioner M/s HINDALCO, Electrical Inspectorate, SLDC and ANERT, and its summary is given below:
- (i) SLDC stated that, it has no difference of opinion on the metering & SCADA visibility provided by Hindalco. Further, comments on interlocking system and banking shall be communicated to the Regulatory Commission after detailed analysis of the scheme
 - (ii) ANERT opined that, generally renewable energy generation shall not be curtailed and hence other options without curtailment of 1 MW solar plant will have been looked into.
 - (iii) Electrical Inspector, on behalf of Chief Electrical Inspector to Government of Kerala stated that, Chief Electrical Inspector has issued scheme approvals and energisation order for the solar plants after proper scrutiny of the scheme, on -site inspection and field testing of all safety features. Further, the interlocking facility using PLC installed by M/s Hindalco Industries Limited to limit the export of power from the 1MWp Solar Power Plant in tariff related matters does not attract any of the relevant provisions of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010. It is learned that, there is no deviation from the electric schematic diagram/ power & safety related installations approved by Electrical Inspectorate. As such, safety issues are not involved in the low voltage PLC controlled

system with interlocking facility for limiting the solar generation from 1MWp Solar Power Plant to grid.

- (iv) Dr. K N Pavithran, Professor (Retd.) – CET, has stated that, he has physically inspected and tested the interlocking system at Hindalco's Solar Plant, the design, engineering and installation of the above system is reliable, failsafe and capable of ensuring no export of energy from 1 MW Solar Power Plant.

12. Third hearing on the petition was conducted on 06.01.2021 through video conference. The summary of deliberations is given below:

- (1) Sri. Sajan Poovayya, Senior Advocate, representing the petitioner submitted that, as instructed by the Commission, they had impleaded SLDC, ANERT and Electrical Inspector as respondents to the petition. Further, a joint virtual meeting was held between the respondents on 30.12.2020 and a copy of the minutes of the meeting was submitted before the Commission vide the affidavit dated 04.01.2021.
- (2) Representatives of ANERT submitted that, on random analysis of the past energy data collected from the petitioner, it is observed that on 13th December, 2020, on three instances there is injection of solar generation while the load of the petitioner is zero. They further submitted that the schematic diagram of the installation was not made available to them.
- (3) SLDC submitted that, they had appraised the time block wise details of the energy transaction of the petitioner for a period of ten days from 01.12.2020 to 10.12.2020. During these periods, in 178 time blocks the petitioner injected energy into the grid for banking of which 138 time block was during the day time. Further, out of the 138 time blocks during which the surplus energy was injected into the grid for banking, about 45% of the time blocks, the petitioner availed power through open access. The petitioner may not be allowed to bank the energy purchased resulting from the excess as a result of purchase through open access from the grid.
- (4) Sri. Tojo Jacob, the representative of the Electrical Inspectorate submitted that, their observation and comments are recorded in the minutes of the meeting held on 30.12.2020. He further submitted that, as per the petitioner Hindalco, the PLC system will drive the 1 MW plant to stop generation under three conditions, viz, (i) when demand is less than 1MW, (ii) at the instances of grid failure (iii) at the instance of communication failure. Anti-islanding is found to be working and hence safety is ensured. There is nothing more to add on this subject matter.

- (5) KSEB Ltd submitted the following during the hearing.
- (i) The contract demand of the petitioner is 5 MVA only. The petitioner has been meeting their power requirement at the factory through three sources of power (a) supply from KSEB Ltd, (b) Self generation from the 1 MW & 2 MW Solar plant owned by the petitioner, and (c) by availing power through open access.
 - (ii) In order to explain the probability of banking the power availed through open access in the pretext of the banking of the power generated from the Solar plants, KSEB Ltd explained in detail the following '5' scenarios.

Case-1.

When the entire demand of the petitioner (up to the contract demand of 5 MVA) is being met from (a) generation from their 1MW and 2MW solar plant and the balance from KSEB Ltd. There is no possibility of gaming under this case.

Case-2.

When the petitioner met their entire demand from (a) self-generation from solar plants (upto 3 MW) and (b) also avails power through Open Access and no supply from KSEB Ltd.

In this case, KSEB Ltd pointed out a scenario when the open access drawal is, say 3 MW, and the Solar generation also 3 MW, as against the load of '5MVA'. Then the net meter shows a drawl of 2MW obtained through Open Access and also there is deemed injection of 1MW into the grid for banking. This injection is on account of availing excess power through Open Access than their load requirement. The power availed through open access is not qualified for banking as per RE Regulations.

Case-3, Case-4 and Case-5 are similar to Case-2, but with increase in quantum of OA power than their requirement after accounting the self-generation from the Solar Plant, and also with no drawl of KSEB Ltd supply.

The summary of the cases presented by KSEB Ltd is given in the Table below.