

Note for Launch of Grid Connected Solar Inverter under BEE's S&L program

About Grid Connected Solar Inverter Labeling program

Renewable Energy sector has become increasingly attractive with the government's increased support and improved economics. One of the key factors driving the Indian solar power market is the increasing investments in renewable energy. In addition, there are favorable regulations and policies such as the National Solar Mission are implemented by the Government of India in order to encourage the adoption of solar energy. Moving forward, on 22nd January 2024, Hon'ble Prime Minister of India announces Pradhan Mantri Suryodaya Yojna under which a rooftop solar system will be installed on 1 crore households.

To avoid comprehension of inefficient solar PV system, it became essential to optimize the performance of the solar PV system through energy efficiency guidelines or standards. The two major components of the solar PV system are Solar Panels and Solar Inverters. To regulate the solar modules market, the Bureau of Energy Efficiency (BEE) has launched Standards & Labeling (S&L) Program for solar PV module on 20th October 2023. BEE further aims to optimize the efficiency of the solar PV system by launching the S&L program for Solar Inverter.

Product Categorization

The Solar Inverters are categorized based on system type, technology, rated output power and its application. In terms of system type, solar inverter is categorized into Grid Connected, Off-Grid and Hybrid solar inverters. Based on technology, the grid connected solar inverter is further categorized into micro, string and central inverters.

Market Scenario

The market size of all types of solar inverters is close to 2,520 MW for FY 2022-23. The grid connected solar inverter dominated the market with 80% of the total solar inverter market share. It is expected that the solar inverter market will be INR 9,352 crore by 2026, with a projected CAGR of 14.4% from 2020 to 2026. As per BEE's market assessment, it is revealed that nearly 63% market share of grid connected solar inverter is of the models with rated output power capacity ranging from 1 kW to 10 kW, 13% share of models are from 11 kW to 20 kW and 24% share of models are above 20 kW rated output capacity.

Energy Savings Potential

The implementation of the endorsement label for grid connected solar inverters is anticipated to yield significant energy savings of 21.1 Billion kWh between FY 2024-25 and FY 2033-2034, accompanied by a potential reduction in CO₂ emissions amounting to 15.1 Million tons of CO₂ in the same time period.

Key Highlights of Solar Inverter Schedule

- The Standards & Labeling program for Grid Connected Solar Inverter will be launched under voluntary phase on 15th March, 2024. The validity of the program will be from 15th March, 2024 to 31st December, 2025.
- The program will function as MEPS (Minimum Energy Performance Standard) for grid connected solar inverter.
- Endorsement Label is adopted for grid connected solar inverters which is based on minimum overall efficiency criteria in accordance with IS 17980:2022/ IEC 62891:2020 as amended from time to time.
- The scope of Solar Inverter under S&L program includes only grid connected solar inverter without storage with rated capacity up to 100 kW, which is align with recent MNRE Quality Control Order (QCO) for solar photovoltaic inverters.
- Only BIS certified solar inverters complied with safety standard IS 16221-2:2015, are eligible to take part in the BEE's S&L program.
- The proposed minimum overall efficiency performance table for Solar Inverter under voluntary phase is given below:

Minimum Overall Efficiency Requirement (Valid from 15th March 2024 to 31st December 2025)	
Rated Output Power (kW)	Minimum Overall Efficiency Requirement
Rated Output Power < 1	92%
1 ≤ Rated Output Power < 3	93%
3 ≤ Rated Output Power < 5	95%
5 ≤ Rated Output Power < 10	96%
10 ≤ Rated Output Power < 20	97%
Rated Output Power ≥ 20	98%

- The labeling fee for affixation of label on solar inverter will be INR 5 /- (Rupees Five Only) per kilo Watt (kW).