

Standards and Labelling (S&L) Program for Solar Photovoltaic Modules

by

Bureau of Energy Efficiency

**Technical Support:
MNRE, NISE & IIT Bombay**

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Standards and Labelling Program

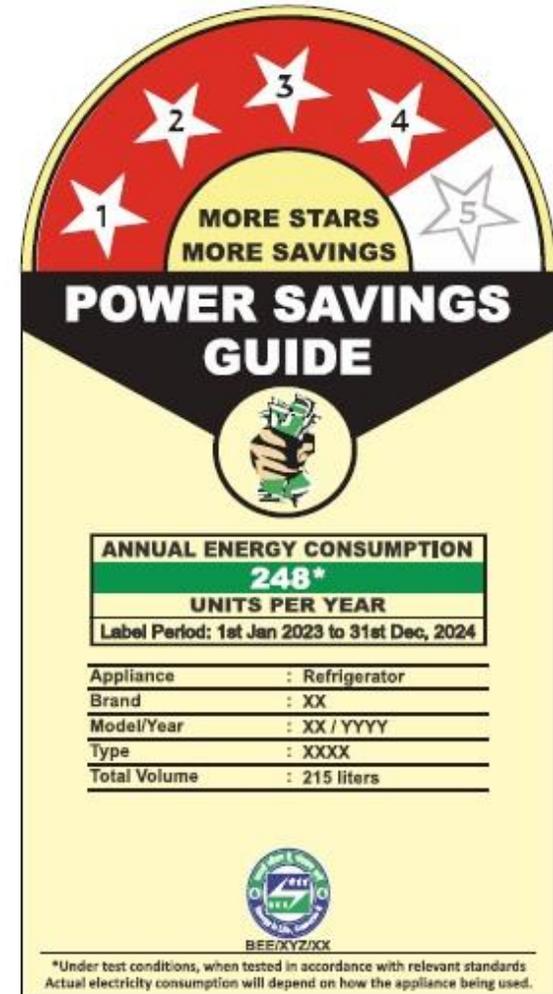


Standards and Labelling program implemented by Bureau of Energy Efficiency (BEE) as per the provisions of section 13 and 14 of Energy Conservation (EC) Act of 2001.

Till 20th October 2023, **34** appliances covered, out of which, **15** under mandatory regime and **19** under voluntary regime.

Total **22,562** models from **3,137** brands are registered under the program.

Total **55 Crore** Star Labelled products manufactured in the year 2021-22 leading to electricity savings of **70.56 BU** and **Co2** emission reduction of **57.05** million tonnes.



List of 34 Appliances/Equipment

Mandatory

- 1) Frost Free Refrigerator
- 2) Direct Cool Refrigerator
- 3) Deep Freezers
- 4) Room Air Conditioner (Variable Speed)
- 5) Room Air Conditioner (Fixed Speed)
- 6) RAC (Cassette, Floor Standing Tower, Ceiling, Corner AC)
- 7) Light Commercial AC Fixed Speed
- 8) Stationary Storage Type Electric Water Heater
- 9) Tubular Fluorescent Lamps
- 10) LED LAMPS
- 11) Ultra-High Definition (UHD) Televisions
- 12) Colour Television
- 13) Distribution Transformer
- 14) Ceiling Fan
- 15) Chillers

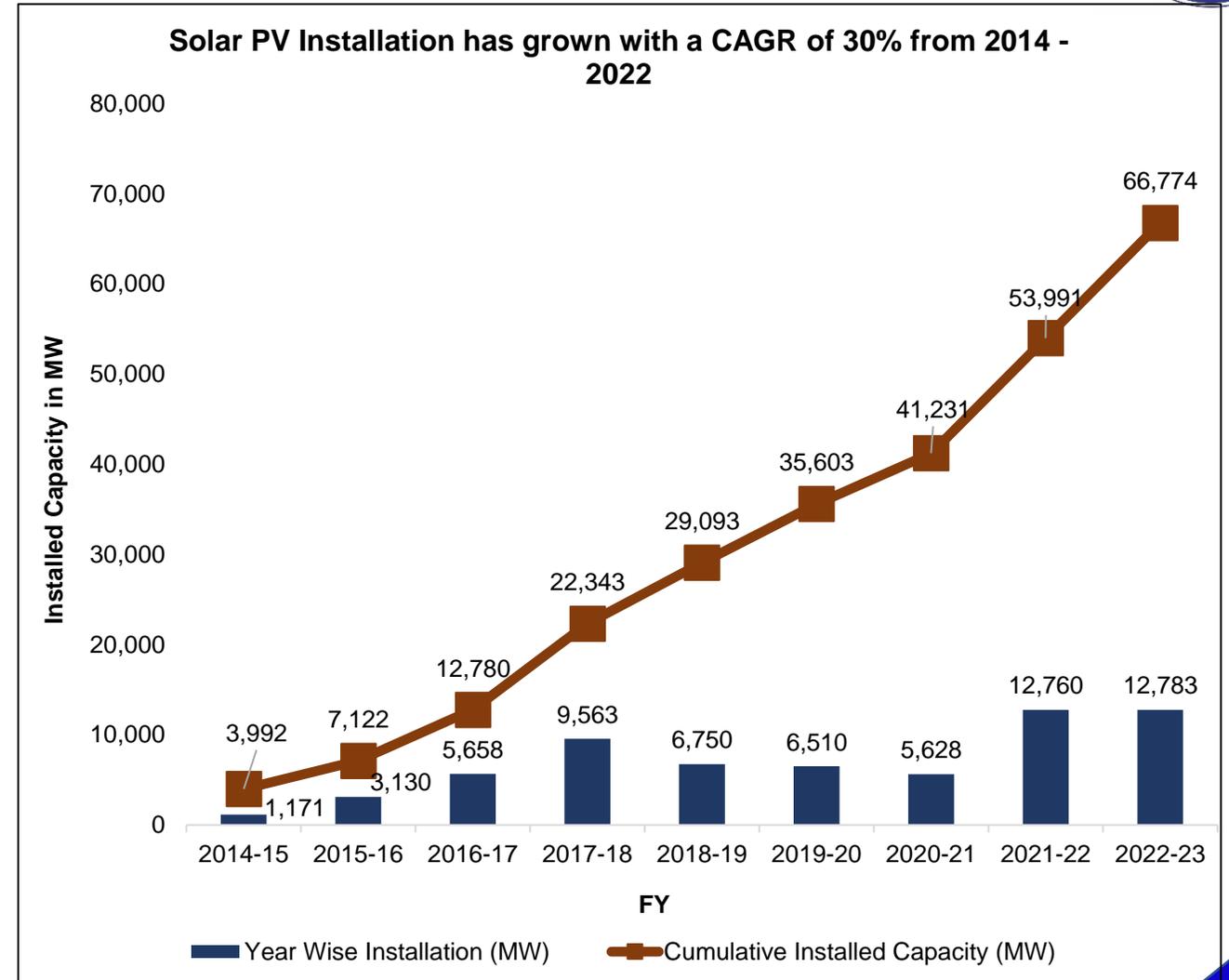
Voluntary

- 1) General Purpose Industrial Motor
- 2) Agricultural Pump Set
- 3) Domestic Gas Stove
- 4) Washing Machine (Semi/Top Load/Front Load)
- 5) Computer
- 6) Ballast
- 7) Office Automation Products
- 8) Diesel Engine Driven Monoset Pumps for Agricultural Purposes
- 9) Solid State Inverter
- 10) Diesel Generator Set
- 11) Microwave Oven
- 12) Solar Water Heater
- 13) Air Compressors
- 14) High Energy Li-Battery
- 15) Tyres/Tires
- 16) Side by Side/Multi Door Refrigerator
- 17) Pedestal Fan
- 18) Table/Wall Fan
- 19) Induction Hob

Solar PV market



- ❑ India has embarked upon an ambitious program, to achieve **40%** of electric power installed capacity from renewable energy sources by 2030.
- ❑ Solar PV modules can be categorized based on the capacity of the modules and on the types of cell technology. Solar PV modules range from **5W to 500 W**.
- ❑ Objective of **S&L program for Solar PV** is to help the Indian customers to make an informed decision and contribute towards Govt's larger goal of enhancing the use of RE, in more efficient manner.



Scope of Standards and Labelling Program of Solar PV



❑ **Scope:** This schedule specifies the energy-labeling requirement for Solar Photovoltaic (PV) modules imported or manufactured in India for electricity generation and similar use. The schedule covers all types and sizes/capacity of Solar Photovoltaic Modules.

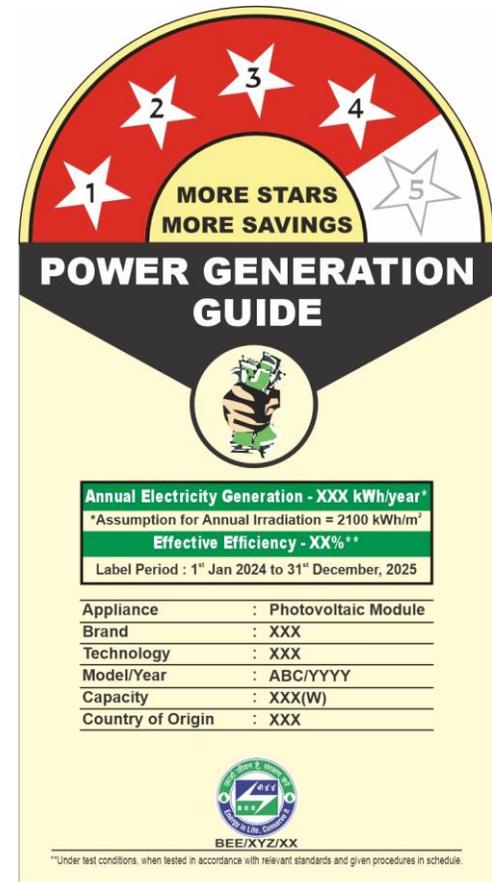
❑ This schedule does not apply to:

- Concentrator Photovoltaic (CPV) Modules and
- Photovoltaic Thermal (PVT) hybrid solar collectors

❑ The Program to be in voluntary regime from 1st January, 2024 to 31st December, 2025.

❑ During these two years labeling fee will be exempted

❑ Details about the registration procedure are available in the Schedule 35 and also in the program's [DISHA manual](#).



Sample Label

Proposed Star Rating Table



Proposed Star Rating	Effective efficiency η_{eff} (%)
Validity period: 1st January 2024 to 31st December, 2025	
1 Star	$\geq 17\% \ \& \ \leq 18\%$
2 Star	$> 18\% \ \& \ \leq 20\%$
3 Star	$> 20\% \ \& \ \leq 21\%$
4 Star	$> 21\% \ \& \ \leq 22\%$
5 Star	$> 22\%$

Benefits of Program for a Typical 10 sqm roof area (1 KWp)



Star Rating	Effective efficiency η_{eff} (%)	Electricity generated per year (kwh)	% increase in electricity generated
1 Star	17%	3570	---
2 Star	19%	3990	12 %
3 Star	21%	4410	23 %
4 Star	22%	4620	29 %
5 Star	23%	4830	35 %

Pre-Qualification Criteria for labelling



Eligibility criteria for participating in Star Labelling program

- To participate in the S&L program, the performance of solar PV module must not degrade beyond 3% after subjecting it to the following design qualification tests individually.
 - Hot-spot endurance test
 - UV preconditioning
 - Thermal cycling test
 - Humidity freeze test
 - Damp heat test

- The design qualification tests must be conducted in accordance with IS 14286: 2010/ IEC 61215: 2005 for crystalline silicon PV modules and IS 16077: 2013/ IEC 61646: 2008 for thin film PV modules.

- The performance of solar PV modules must not degrade beyond 3% post the PID test. The modules must be tested for PID as per IS 17210 (Part 1): 2019.



Ministry of
Power



Ministry of New
and Renewable
Energy



Launch of Standards and Labelling (S&L) Program for **Solar Photovoltaic Modules**

Shri R.K.Singh

**Hon'ble Union Minister for Power and NRE
Government of India**

Ministry of Power,

Shram Shakti Bhawan, New Delhi

Date: 20-10-2023





Thank you