

**F. No. 283/62/2020-GRID SOLAR**  
भारत सरकार / Government of India  
**नवीन और नवीकरणीय ऊर्जा मंत्रालय/ Ministry of New & Renewable Energy (MNRE)**  
ग्रिड सौर ऊर्जा प्रभाग / Grid Solar Power Division

Block No. 14, C.G.O. Complex,  
Lodi Road, New Delhi - 110003

**Dated: 28<sup>th</sup> April, 2021**

To

**The Pay & Accounts Officer,**  
Ministry of New & Renewable Energy  
New Delhi - 110003.

**Sub: Production Linked Incentive Scheme 'National Programme on High Efficiency Solar PV Modules'**

Sir/ Madam,

I am directed to convey the sanction of President for implementation of Production Linked Incentive scheme 'National Programme on High Efficiency Solar PV Modules' for achieving manufacturing capacity of Giga Watt (GW) scale in High Efficiency Solar PV modules.

**2.0 Aims and Objectives:**

**2.1 Aim:** To promote manufacturing of high efficiency solar PV modules in India and thus reduce import dependence in the area of Renewable Energy.

**2.2 Objectives:**

- a. To build up solar PV manufacturing capacity of high efficiency modules.
- b. To bring cutting edge technology to India for manufacturing high efficiency modules. The scheme will be technology agnostic in that it will allow all technologies. However, technologies which result in better module performance will be incentivized.
- c. To promote setting up of integrated plants for better quality control and competitiveness.
- d. To develop an ecosystem for sourcing of local material in solar manufacturing.
- e. Employment generation and technological self-sufficiency.

**3.0 Implementation Methodology:** The Scheme will be implemented as per the detailed Scheme Guidelines enclosed at Annexure-I.

**4.0** Necessary funds for implementation of this Scheme during 2021-22 (if any required) and subsequent years will be drawn from the budgetary allocations to Ministry of New & Renewable Energy.

**5.0** This sanction issues in exercise of powers delegated to this Ministry and with the concurrence of IFD vide their Dy. No. 12 dated 28.04.2021 and approval of competent authority dated 27.04.2021.

Yours faithfully,



**(Sanjay G. Karndhar)**  
Scientist-D

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**Copy for information and necessary action to:**

1. All Central Government Ministries and Departments.
2. NITI Aayog, Sansad Marg, Sansad Marg Area, New Delhi.
3. Renewable Energy /Power/Energy Departments of all States & UTs.
4. State Nodal Agencies for Renewable Energy (SNAs) of all States / UTs.
5. Major Public Sector Enterprises operating in Renewable Energy /Power /Energy sector.
6. Principal Director of Audit, Scientific Audit-II, DGACR Building, I.P. Estate, Delhi - 110002.
7. Director General (Local Bodies), Office of the Comptroller & Auditor General, 9-Deendayal Upadhyay Marg, New Delhi.
8. Indian Renewable Energy Development Agency Limited (IREDA), 3rd Floor, August Kranti Bhawan, Bhikaiji Cama Place, New Delhi - 110 066
9. National Institute of Solar Energy (NISE), Gwal Pahari, Faridabad-Gurugram Road, Gurugram, Haryana- 122003.
10. Solar Energy Corporation of India Limited (SECI), 6th Floor, Plate-B, NBCC Office Block Tower-2, East Kidwai Nagar, New Delhi-110023.

**Internal Distribution:**

1. PS to Hon'ble Minister of State (I/C) for New & Renewable Energy, Power and MoS for Skill Development and Entrepreneurship
2. Sr. PPS to Secretary, MNRE
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Yours faithfully,



**(Sanjay G. Karndhar)**

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Guidelines for Production Linked Incentive Scheme 'National Programme on High Efficiency Solar PV Modules'

**Sub:** Scheme Guidelines for Implementation of the Production Linked Incentive scheme 'National Programme on High Efficiency Solar PV Modules' for achieving manufacturing capacity of Giga Watt (GW) scale in High Efficiency Solar PV modules.

**1.0 Introduction & Background:**

**1.1.** On 11 November, 2020, the Cabinet approved introduction of Production Linked Incentive (PLI) Scheme for 10 key Sectors, for enhancing India's manufacturing capabilities and exports under Atmanirbhar Bharat initiative. One of the 10 sectors for which introduction of Production Linked Incentive (PLI) has been approved by the Cabinet is 'High Efficiency Solar PV Modules' for which Ministry of New & Renewable Energy (MNRE) has been designated as the implementing Ministry. The financial outlay for PLI for 'High Efficiency Solar PV Modules', as approved by the Cabinet and communicated vide NITI Aayog's Order No. 13(176)/2020-I&M (I) dated 20.11.2020, over a five-year period is ₹ 4,500 crore.

**1.2 Background:**

India has set an ambitious target of setting up 1,75,000 MW capacity of renewable energy by 2022 and 4,50,000 MW by 2030. On the basis of techno-economic analysis, Central Electricity Authority (CEA) has indicated in their Optimum Energy Mix report that 2,80,000 MW capacity from solar energy will be needed by 2029-30. To achieve the target, around 25,000 MW solar energy capacity is needed to be installed every year, till 2030. Solar capacity addition presently depends largely upon imported solar PV cells and modules as the domestic manufacturing industry has limited operational annual capacities of around 2,500 MW for solar PV cells and 9,000-10,000 MW for solar PV modules.

**2.0 Aims and Objectives:**

**2.1 Aim:** To promote manufacturing of high efficiency solar PV modules in India and thus reduce import dependence in the area of Renewable Energy.

**2.2 Objectives:**

- a. To build up solar PV manufacturing capacity of high efficiency modules.
- b. To bring cutting edge technology to India for manufacturing high efficiency modules. The scheme will be technology agnostic in that it will allow all technologies. However, technologies which will result in better module performance will be incentivised.
- c. To promote setting up of integrated plants for better quality control and competitiveness.
- d. To develop an ecosystem for sourcing of local material in solar manufacturing.
- e. Employment generation and technological self-sufficiency.

**3.0 Implementation Methodology:**

The Ministry of New and Renewable Energy has decided to implement a National Programme on Solar PV Manufacturing involving Production Linked Incentive (PLI) to enhance domestic

manufacturing capacity of High Efficiency Solar PV Modules, for which the Cabinet has given approval on 11<sup>th</sup> November, 2020 and allocated an amount of ₹ 4,500 crore to be spent over a period of five years.

### 3.1 Implementing Agency:

- (i) The PLI scheme will be implemented by MNRE through Indian Renewable Energy Development Agency (IREDA) as Implementing Agency. IREDA will be responsible for providing secretarial, managerial and implementation support and carrying out other responsibilities as assigned by MNRE from time to time. The responsibilities of IREDA inter alia, include receipt of applications, examination and appraisal of applications as per the modalities of this scheme, issuing acknowledgements to applicants, making appropriate recommendations to MNRE after assigning inter-se ranking for approval of beneficiaries, examination of claims of beneficiaries for disbursement of PLI, verification and reconciliation of disbursement claims with prescribed documents and making appropriate recommendations to MNRE in this regard, compilation of data regarding progress and performance of the scheme through Quarterly Review Reports and other information / documents. IREDA will also submit progress to MNRE on a quarterly basis along with details of disbursement claims received for PLI, amount disbursed, reasons for delay in disbursement of the incentives etc. IREDA will be eligible to get 1% of the PLI amount disbursed as administrative charges on annual basis.
- (ii) IREDA will have the right to carry physical inspection of an applicant's manufacturing units and offices through site visits. It will take help of National Institute of Solar Energy (NISE) for measurement of efficiency and temperature co-efficient of modules. If required, MNRE may also designate National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited labs, etc. for such measurement.

### 3.2 Selection of beneficiaries: Beneficiaries of the PLI scheme will be selected through a transparent bidding process. Applications will be shortlisted after consideration of the following parameters:

- a) **Extent of Integration:** Preference will be given to manufacturers who propose to set up a fully integrated solar PV manufacturing plant using silicon based technology (starting from the stage of manufacturing of polysilicon, to Ingot/Wafer to Solar Cell and Module) or fully integrated Thin Film technology or any other technology. However, in order to qualify for the bid, the applicant manufacturer will have to promise minimum integration across solar cells and modules.
- b) **Manufacturing Capacity:** Preference will be given to manufacturers who set up higher capacity plants. However, in order to qualify for the bid, the applicant manufacturer will have to undertake to set up a manufacturing plant of minimum 1,000 MW capacity (1,000 MW each for all individual stages included in the manufacturer's proposal).
- c) **Minimum module performance:** Manufacturers will also have to fulfill following minimum performance parameters:

*Minimum module efficiency of 19.50% with temperature coefficient of Pmax better than -0.30% per degree Celsius*

*Or*

*Minimum module efficiency of 20% with temperature coefficient of Pmax equal to or better than -0.40% per degree Celsius*

**3.3 Inter se ranking of the bidders and other eligibility conditions:**

- a) **Inter se ranking:** Bidders who fulfill the minimum conditions as specified in para 3.2 (a), (b) and (c) above will be shortlisted. Subsequently, they will be assigned marks, for determining their inter-se position as per the following selection criteria table:

<b>SELECTION CRITERIA Table</b>			
<b>Parameter</b>	<b>Stages of manufacturing</b>	<b>Marks</b>	<b>Max Marks</b>
<b>1. Extent of Integration</b>	<b>Stage-1:</b> Manufacturing of Polysilicon from outsourced (imported/ domestic) M.G. Silica + <b>Stage-2:</b> Manufacturing of Ingots-Wafers from Stage-1 Polysilicon + <b>Stage-3:</b> Manufacturing of solar cells from Stage-2 Wafers + <b>Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or Fully integrated manufacturing of Thin Film plant or fully integrated plant of any other technology</b>	50	50
	<b>Stage-2:</b> Manufacturing of Ingots-Wafers from outsourced Polysilicon + <b>Stage-3:</b> Manufacturing of solar cells from Stage-2 Wafers + <b>Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or similar level of integration of any other technology</b>	35	
	<b>Stage-3:</b> Manufacturing of solar cells from outsourced Wafers + <b>Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or similar level of integration of any other technology</b>	20	
<b>2. Manufacturing Capacity (in MW)</b>	4,000 MW & above	50	50
	3,500 MW and above but less than 4,000 MW	45	
	3,000 MW and above but less than 3,500 MW	40	
	2,500 MW and above but less than 3,000 MW	35	
	2,000 MW and above but less than 2,500 MW	30	
	1,500 MW and above but less than 2,000 MW	25	
	1,000 MW and above but less than 1,500 MW	20	

Note: The bidder manufacturer getting higher marks will get preference in allocation of manufacturing capacity under the PLI scheme. In case of equal marks, the bidder/ manufacturer quoting least total PLI amount for five years' period as per Para 3.5 below, followed by higher 'Extent of integration' followed by higher 'Manufacturing Capacity' will get priority in selection.

- b) **Bidders eligible for PLI:** The bidder manufacturer can be a single company or a Joint Venture/ Consortium of more than one company. However, in case of Joint Venture/Consortium, a partner/company will be allowed to tie up their manufacturing capacity (of any stage) with another partner/company for one bid only. The selection of the beneficiaries will be done by the bucket filling method keeping in view the overall PLI limit of ₹ 4,500 crore, and the PLI requirements quoted by the bidders. The bidder getting highest marks/inter se position will get PLI amount for five years as quoted by him followed by 2nd bidder and so on till the PLI amount of ₹ 4,500 crore is exhausted. Manufacturing units which have availed any benefit under the MNRE's tender(s) for solar Power Purchase Agreements linked to PV manufacturing or SIPS/ M-SIPS programme of Ministry of Electronics & Information Technology (MEITY) will not be eligible for benefits under this programme. Manufacturing units which have imported capital goods for setting up the module manufacturing facility before the last date of bid submission will not be eligible for participation under the PLI scheme.

- c) **Waiting List:** A waiting list on the basis of marks (valid for six months from the date of selection of the bidder manufacturers) will be maintained in case of substantial over subscription of the bid. In case, the Ministry gets additional financial outlay over and above ₹ 4,500 crore, the waiting list will be cleared following the same bucket filling method.

**3.4 Greenfield & Brownfield projects:** Greenfield new solar PV module manufacturing units will be eligible for PLI. Brownfield projects will also be allowed to participate subject to the fulfilment of prescribed eligibility criteria for greenfield projects as mentioned at 3.2(a), 3.2(b) and 3.2(c). PLI rate for such Brownfield projects will be 50% of the rate for Greenfield projects. Brownfield projects will refer to all such new solar PV manufacturing capacities set up by the existing solar PV manufacturers which share some common infrastructure facilities with the pre-existing solar PV manufacturing capacities or addition of new manufacturing lines in the existing solar PV manufacturing facilities.

### **3.5 Calculation of Production Linked Incentive (PLI):**

- (i) PLI will be calculated as per following formula:  $PLI (\text{₹}) \text{ to manufacturers} = \text{Sales Volume (Wp)} \times \text{Base PLI Rate (₹/Wp as per position in Performance Matrix mentioned in para 3.7)} \times \text{Tapering Factor as explained in para 3.7.1 (1.4, 1.2, 1, 0.8, 0.6 for 1st, 2nd, 3rd, 4th \& 5th year respectively)} \times \text{Local Value Addition expressed in fraction of one}$ . At the time of bidding, the bidders will also have to submit the quantum of total PLI required for the five year period post commissioning of the manufacturing unit. They will calculate PLI requirement for each individual year, based on the estimated values of the parameters in the formula above.
- (ii) The actual PLI given to a manufacturer will depend on actual sales or the maximum capacity awarded under the PLI scheme, whichever is less, as explained in para 3.6, his actual position in the Performance Matrix and actual local value addition. However, the bidders, will in no case, be eligible for any PLI over and above the PLI requirement quoted by them for a particular year. In case a selected manufacturer fails to meet the extent of integration or manufacturing capacity promised at the time of selection, he will not get any PLI till he overcomes these deficiencies. If the manufacturer achieves the promised levels subsequently, he will be eligible for PLI from the next month following the month in which he achieved the promised levels of integration and capacity. However, in such cases, the manufacturer will not be able to get PLI for full 5 years since 5 years PLI is counted from the scheduled date of commissioning of the plant. In case, the modules manufactured by a selected manufacturer do not meet the minimum performance parameters mentioned at para 3.2(c), then he will not get any PLI in respect of such modules.

**3.6 Maximum Sales (in MW) covered:** Though a manufacturer can bid for any capacity (MW), the maximum capacity that can be awarded, to one bidder under the PLI scheme, is 50% of the bid capacity (capacity which he has promised to set up in his bid) or 2000 MW, whichever is less, to accommodate at least three manufacturers under the overall envelope of ₹ 4,500 crore. PLI will be given on actual production and sales of high efficiency module by the selected units. In case, the annual sales (in MW) of a unit is more than the capacity (in MW) awarded to it, PLI will be limited to the sales (MW) equal to the capacity (MW) awarded under the PLI scheme.

**3.7 Performance Matrix:** On the basis of module efficiency and module's temperature co-efficient of Pmax (hereinafter also referred to as module's temperature co-efficient), 'Base PLI rate' will be determined in ₹/Watt peak (₹/Wp) as per the Performance Matrix Table given below:

PERFORMANCE MATRIX TABLE						
	Module Efficiency (%) →	During five Year period after commissioning				
		Base PLI Rate (₹/Wp)**				
		Less than 19.50%	19.50% and above but less than 20%	20% and above upto 21.5%	Above 21.5% & upto 23%	Above 23%
Module's Temperature Coefficient of Pmax* (in % per degree Celsius)↓	Position		W	X	Y	Z
Worse than -0.40		0	0	0	0	0
-0.40 to -0.30	A	0	0	2.50	3.00	3.50
Better than -0.30	B	0	2.25	2.75	3.25	3.75

\* Pmax = Maximum Power at Standard Test Conditions (STC), i.e. Irradiance 1000 W/m<sup>2</sup>, cell temperature 25°C, air mass (AM)= 1.5; Module's temperature coefficient refers to percentage change in Pmax per degree Celsius rise in temperature

\*\* Increase in the Base PLI Rate (₹/Wp) of ₹0.25/Wp for different module efficiency has been kept to motivate and incentivize manufacturers for producing higher efficiency module which requires higher investment for R&D.

**3.7.1 Tapering of PLI:** In order to give a signal to solar PV manufacturing industry that they will need to be competitive after five years, the PLI rate (₹/Wp) will be higher in the beginning and lower towards the end of five-year period. To achieve the objective of tapering down the PLI rate (in ₹/Wp), the PLI rate (₹/Wp) will be multiplied by a tapering factor of 1.4 for the 1<sup>st</sup> year of the five year PLI disbursement period followed by a tapering factor of 1.2, 1.0, 0.8 and 0.6 for the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> year of the PLI disbursement period respectively.

**3.8 Disbursement of PLI:** The manufacturing units sanctioned under the programme would be eligible for getting PLI on annual basis on sales of high efficiency solar PV modules for 5 years from commissioning or 5 years from scheduled commissioning date, whichever is earlier. Consequently, in case of delayed commissioning, the PLI period will reduce from 5 years by the quantum of such delay in commissioning. A team constituted by MNRE or IREDA will visit the manufacturing unit immediately after its commissioning to verify promised extent of integration, manufacturing capacity, efficiency and temperature co-efficient of modules. The manufacturers will be asked to give a self-declaration and a Statutory Auditor's or Chartered or Cost Accountant's certificate in support of claims of PLI. The manufacturers will be required to provide documents in support of the PLI claimed for a particular year based on (i) sales (watt) of modules, (ii) percentage of local value addition and (iii) PLI rate (as per the position in Performance Matrix). Documents required to be submitted by manufacturer for availing PLI will be detailed out in the tender documents. MNRE will also make provisions for adequate safeguards, including for periodical special audits and appointing technical organisations to conduct sample checks to verify claims of manufacturers in respect of module efficiency and temperature coefficient.

**3.9 Local Value Addition:** Manufacturers will be encouraged to source their material from domestic market. The PLI amount will increase with the increased local value addition. The percentage of Local Value Addition will be calculated as follows:

$$\frac{[(\text{Sale value of Module as per GST invoice excluding net domestic indirect taxes}) - (\text{Value of direct and indirect imported materials and services (including all customs duty) as per Bill of Entry filed in Customs, used in manufacture of module})]}{[(\text{Sale value of Module as per GST invoice excluding net domestic indirect taxes})]} \times 100\%$$

**3.10 Timelines for commissioning of solar PV manufacturing facilities:** The time-period allowed for commissioning of solar PV manufacturing units under the Scheme is as follows:

Type of solar PV manufacturing plant	Time allowed for commissioning
<b>Stage-1:</b> Manufacturing of Polysilicon from outsourced (imported/domestic) M.G. Silica <b>+ Stage-2:</b> Manufacturing of Ingots-Wafers from Stage-1 Polysilicon <b>+ Stage-3:</b> Manufacturing of solar cells from Stage-2 Wafers <b>+ Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or</b> Fully integrated manufacturing of Thin Film plant <b>or</b> fully integrated plant of any other technology	Within 3 years from date of sanction
<b>Stage-2:</b> Manufacturing of Ingots-Wafers from outsourced Polysilicon <b>+ Stage-3:</b> Manufacturing of solar cells from Stage-2 Wafers <b>+ Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or</b> similar level of integration of any other technology	Within 2 years from date of sanction
<b>Stage-3:</b> Manufacturing of solar cells from outsourced Wafers <b>+ Stage-4:</b> Manufacturing of Modules from Stage-3 Solar Cells <b>or</b> similar level of integration of any other technology	Within 1.5 years from date of sanction

**3.11 Penalties:**

- (i) In case a selected manufacturer fails to meet the promised integration or capacity or minimum module performance after his selection, he will not get any PLI till he overcomes these deficiencies. If the manufacturer achieves the promised levels subsequently, he will be eligible for PLI from the next month following the month in which he achieved the promised levels. However, in such cases, the manufacturer will not be able to get PLI for full 5 years since 5 years PLI is counted from the scheduled date of commissioning of the plant.
- (ii) Bidders will have to submit, at the time of signing of Contract Agreement with IREDA, Performance Bank Guarantees (PBG). In case they fail to implement the promised 'Extent of integration' or the 'Manufacturing capacity' submitted by them in their bids, within scheduled commissioning date, Bank Guarantees commensurate to the manufacturing commitments not fulfilled by the bidder will be forfeited by IREDA and balance Bank Guarantees will be released by them. Detailed modalities in this regard will be given in tender documents.
- (iii) To ensure that the bidder-manufacturers quote realistic year-wise PLI requirement, so as to accommodate more beneficiaries, in case of actual PLI claimed by the successful bidder-manufacturer in a particular year is less than the amount of PLI quoted by him, at the time of bid submission, for that particular year, by 25% or more, then the amount of PLI to be disbursed to such manufacturer for that particular year will be limited to 95% of the PLI amount, which he



would have been otherwise eligible (as per his sales, position in performance matrix and local value addition) for that particular year.

**3.12 Monitoring of the PLI scheme and power to remove difficulties:**

- (i) As approved by the Cabinet on 11<sup>th</sup> November 2020, the Empowered Group of Secretaries (EGoS) chaired by Cabinet Secretary will monitor the PLI scheme, undertake periodic review of the outgo under the scheme, ensure uniformity of all PLI Schemes and take appropriate action to ensure that the expenditure is within the prescribed outlay. Any changes required in the modalities of the scheme, subject to the condition that the overall financial outlay remain within ₹ 4500 crore, will be placed for consideration of the EGoS.
- (ii) Any changes required in the scheme guidelines, without changing the modalities which require placing before EGOS as mentioned in Para 3.12(i) above, will be done with the approval of Hon'ble Minister (New & Renewable Energy), subject to the condition that the overall financial outlay remain within ₹ 4500 crore.

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