

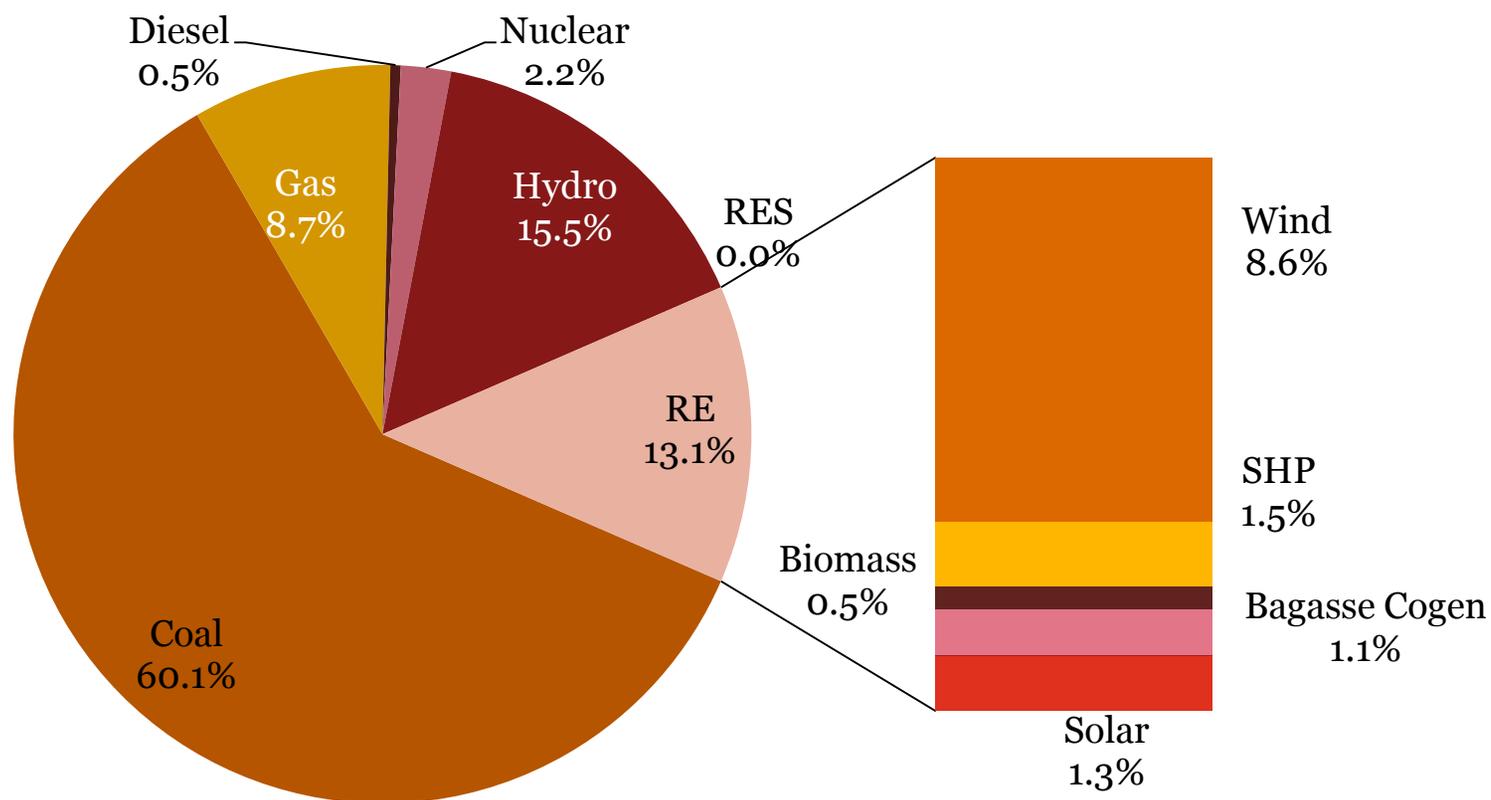
Updates on Solar Developments in India

Government of India
Ministry of New and Renewable Energy (MNRE)
15th June, 2015



Present Power Scenario of India

Total installed capacity of **263.66 GW** and RE capacity of **34.35 GW (13% of Installed capacity and approximately 7% of electricity produced)** (as on March 2015)



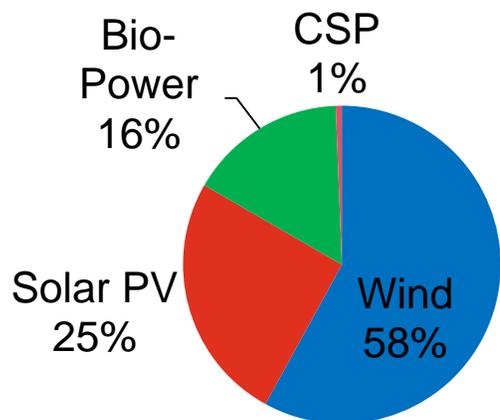
*Source: MNRE, GoI ; CEA Statistics

Workshop on the India Energy Outlook • MNRE

13 April, 2015

Renewable Energy: Globally and India's position

Global Installed RE Capacity

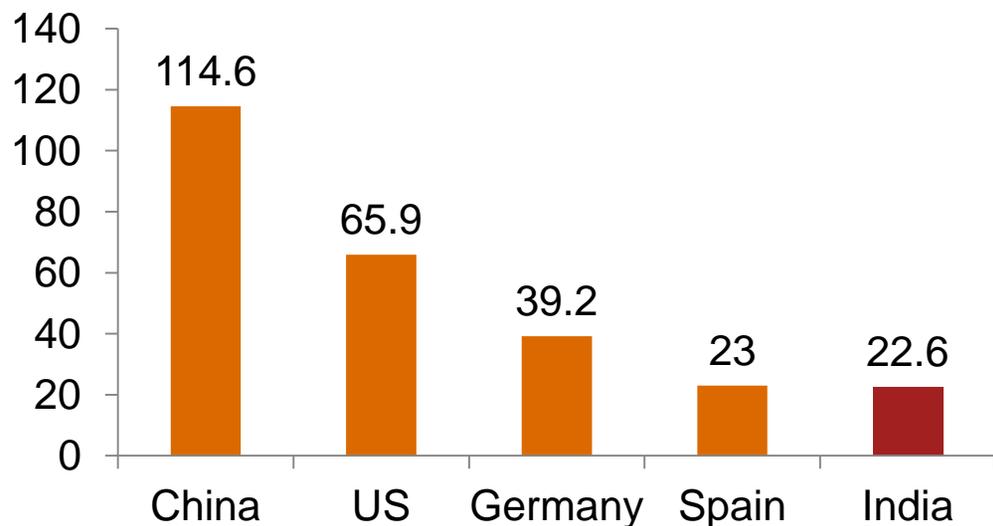


- Global RE installed capacity of 673 GW*
- Global Wind: 370 GW* and India **5th** with 22.6 GW
- Global Solar: 177 GW** and India **11th** with 3.3 GW

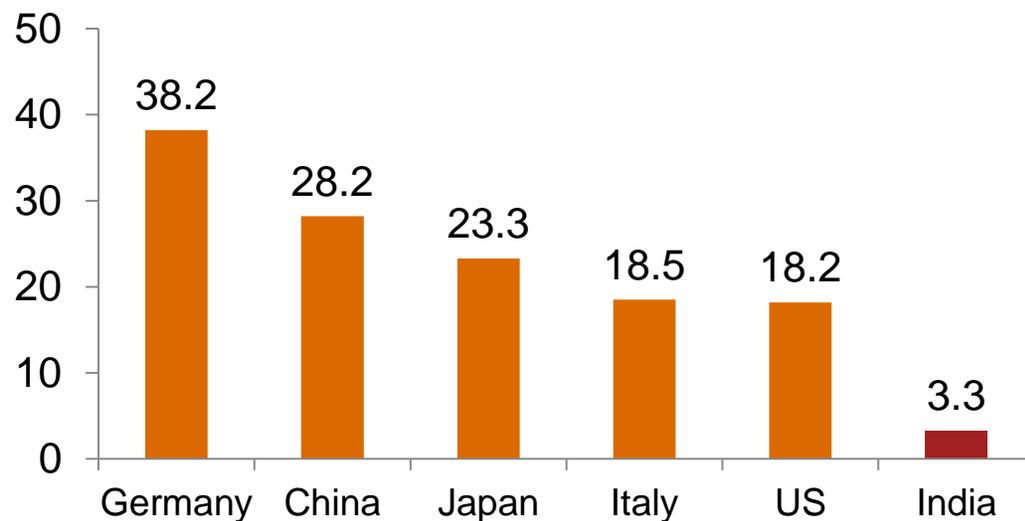
*As on Dec 2014: Global Wind Energy Council

**As on Jan 2014, IEA PVPS)

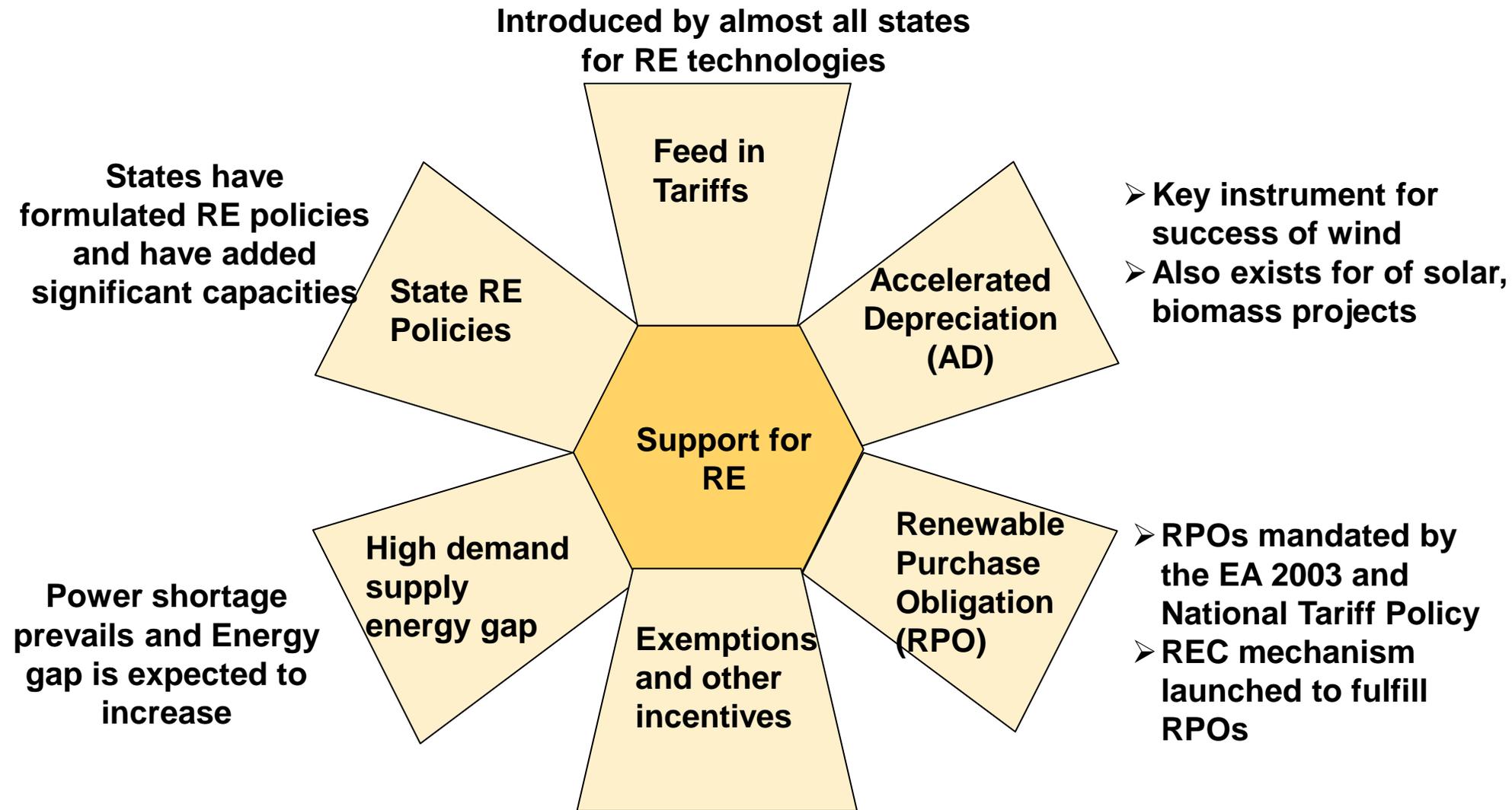
Country wise Wind (GW)



Country wise Solar (GW)



Support Mechanism for Renewable Power In India



Policy and Regulatory Framework for RE development (1)

Electricity Act (EA), 2003

National Electricity Policy (NEP), 2005

EA, 2003

1. Section 86 - promotes RE by ensuring grid connectivity & sale of RE.
2. Section 3 - Central Government to develop a national policy for optimal utilization of resources including RE .
3. SERC's to:
 - Section 86 - fix minimum % energy purchase from RE sources (RPO).
 - Section 61 – determine tariffs for the promotion of RE

NEP, 2005

1. Section 5.2.20 of NEP promotes private participation in RE.
2. Section 5.12.1 of NEP targets capital cost reduction in RE through competition.
3. Section 5.12.2 of NEP states that SERCs should specify appropriate tariffs to promote RE and specify targets for RE.

Policy and Regulatory Framework for RE development (2)

National Tariff Policy (NTP) 2006

National Action Plan for Climate Change, 2008

REC Mechanism, 2010

NTP, 2006

1. A minimum percentage procurement should be made applicable latest by April 1, 2006
2. A preferential tariff to be determined by SERC to enable RET's to compete
3. Procurement of RE by distribution licensee through competitive bidding.

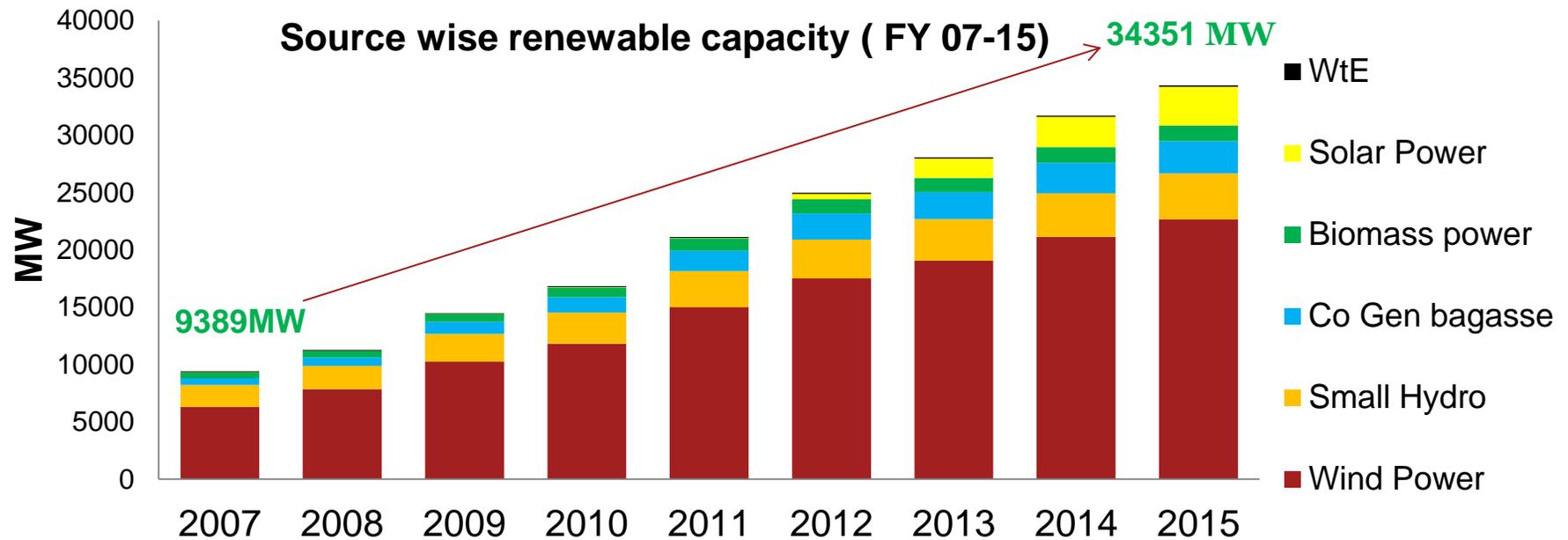
National Action Plan for Climate Change, 2008

1. A dynamic minimum renewable purchase standard (DMRPS) may be set, with escalation each year till a pre-defined level is reached.
2. NAPCC has set the target of 5% RE purchase for FY 2009-10, with increase of 1% in target each year for the next 10 years

REC Mechanism, 2010

1. A mechanism which will enable and recognize the inter-State RE transactions
2. Seeks to address the mismatch between availability of RE sources and the requirement of the obligated entities to meet their RPO across States

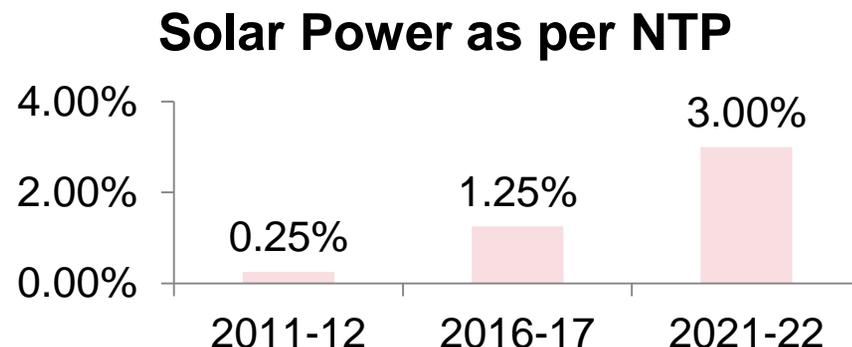
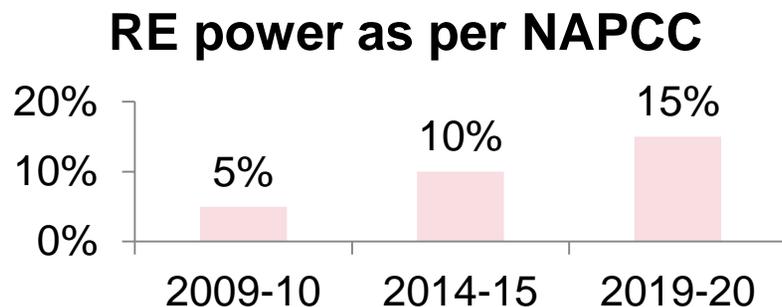
RE in India: Status and Revised targets



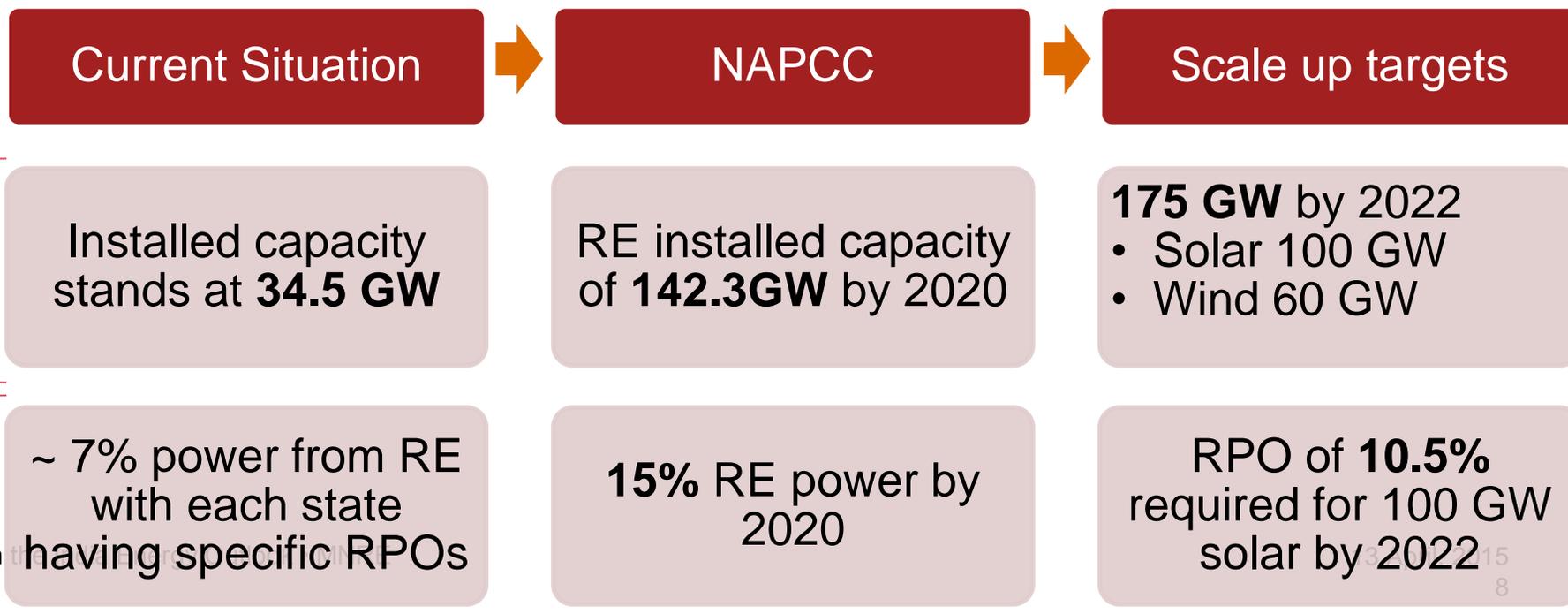
Capacities in MW				
Source	Installed capacity by end of 11 th Plan (March 2012)	Current installed Capacity (March 2015)	Target as per 12 th Plan (March 2017)	Revised Targets till 2022
Solar Power	941	3,383	10,941	1,00,000
Wind power	17,352	22,645	32,352	60,000
Biomass Power	3,225	4,183	6,125	10,000
Small Hydro	3,395	4,025	5,495	5,000
TOTAL	24,914	34351	54,914	1,75,000

RPO revision with scale up plans

Targets Previously:

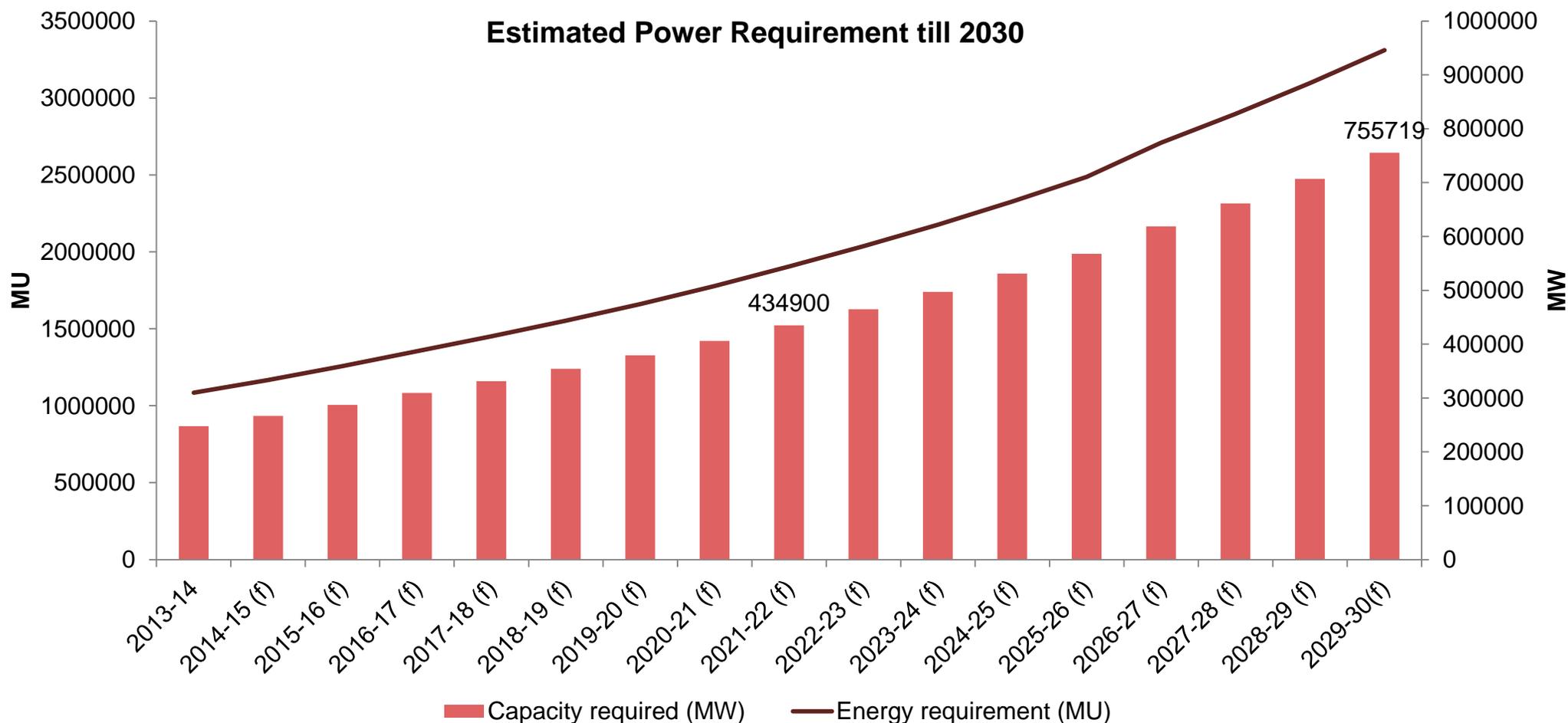


New Vision:



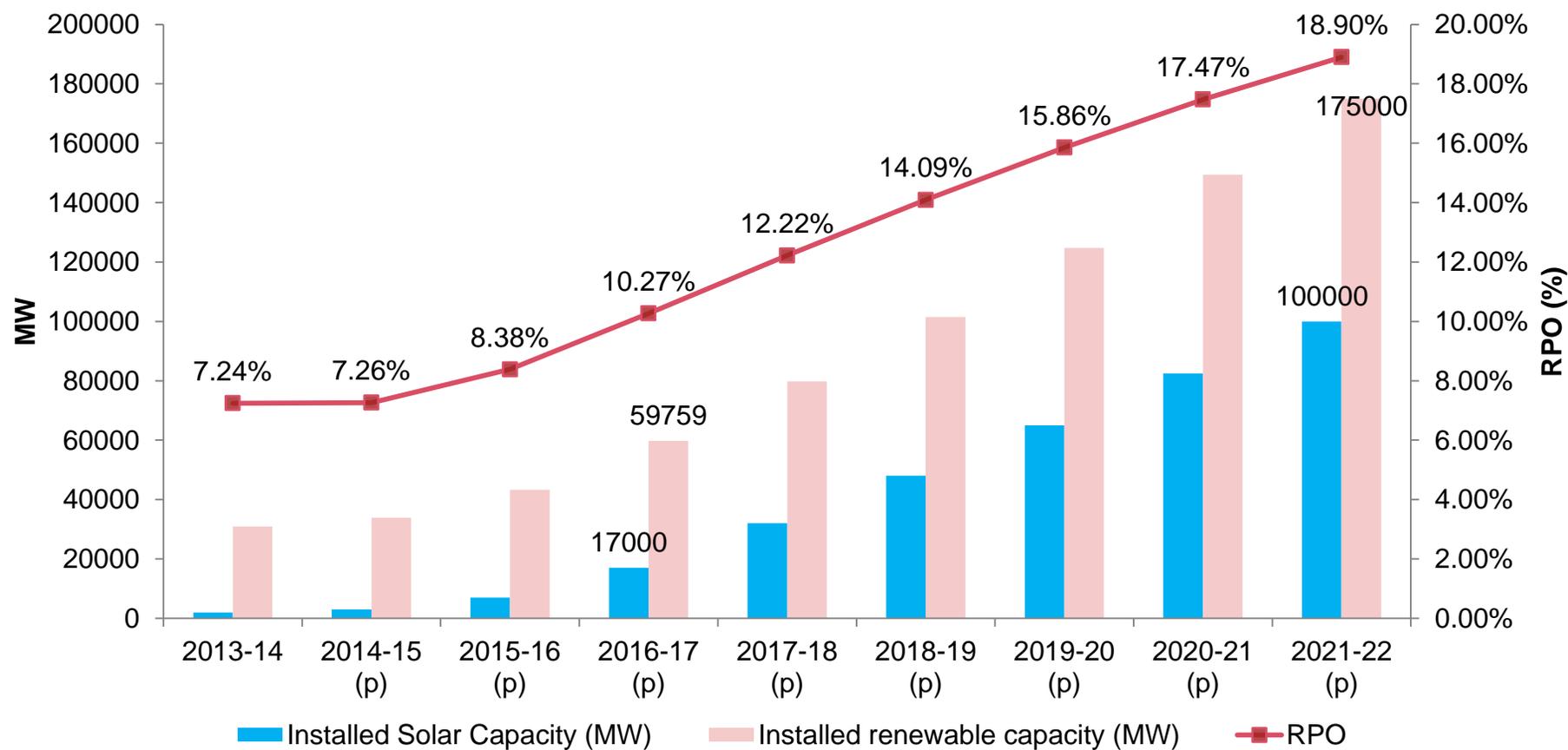
Projected power requirement

Energy requirement is expected to increase by 200% from FY 15 to FY 30

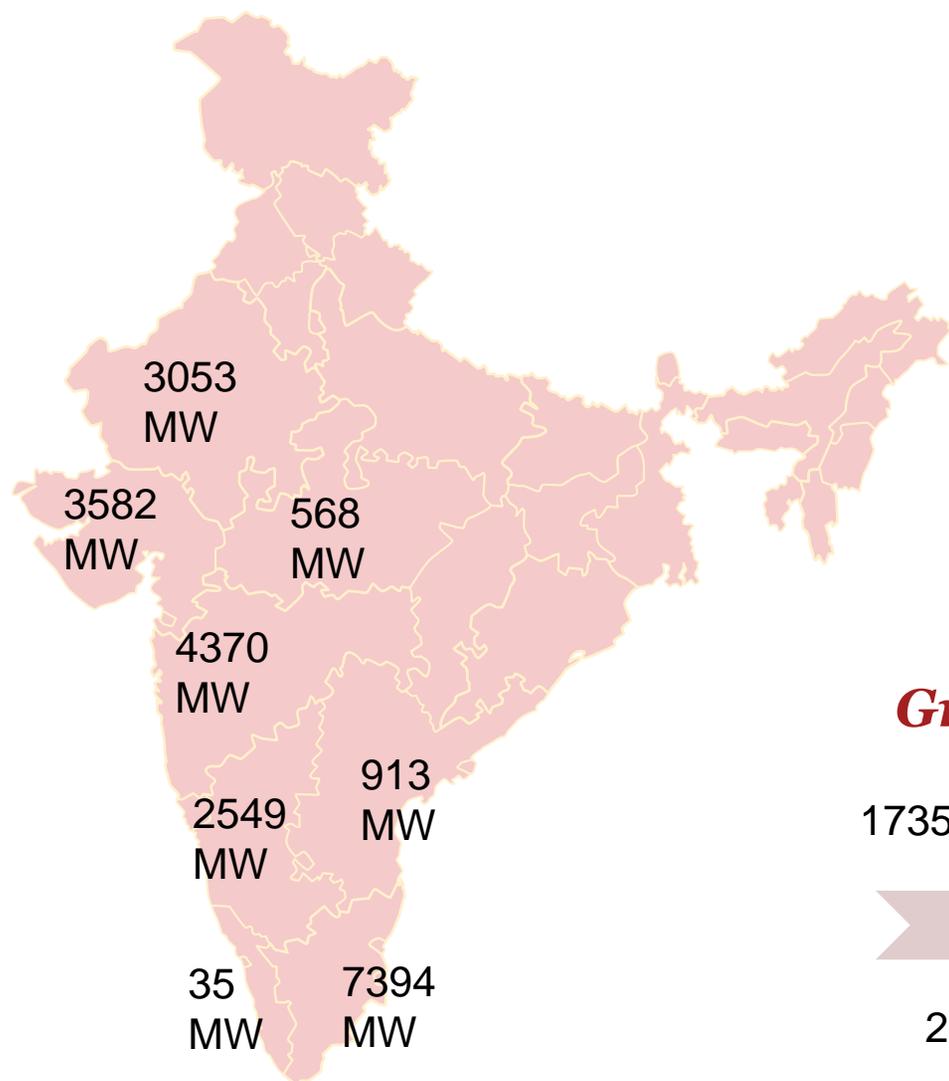


Share of RE in future energy mix

175 GW RE will contribute to **18.9%** of the entire power consumption in India in 2022

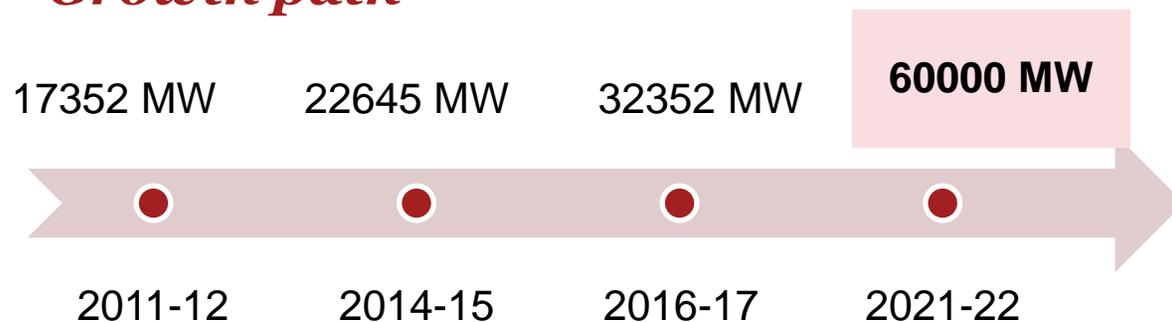


Wind energy across states



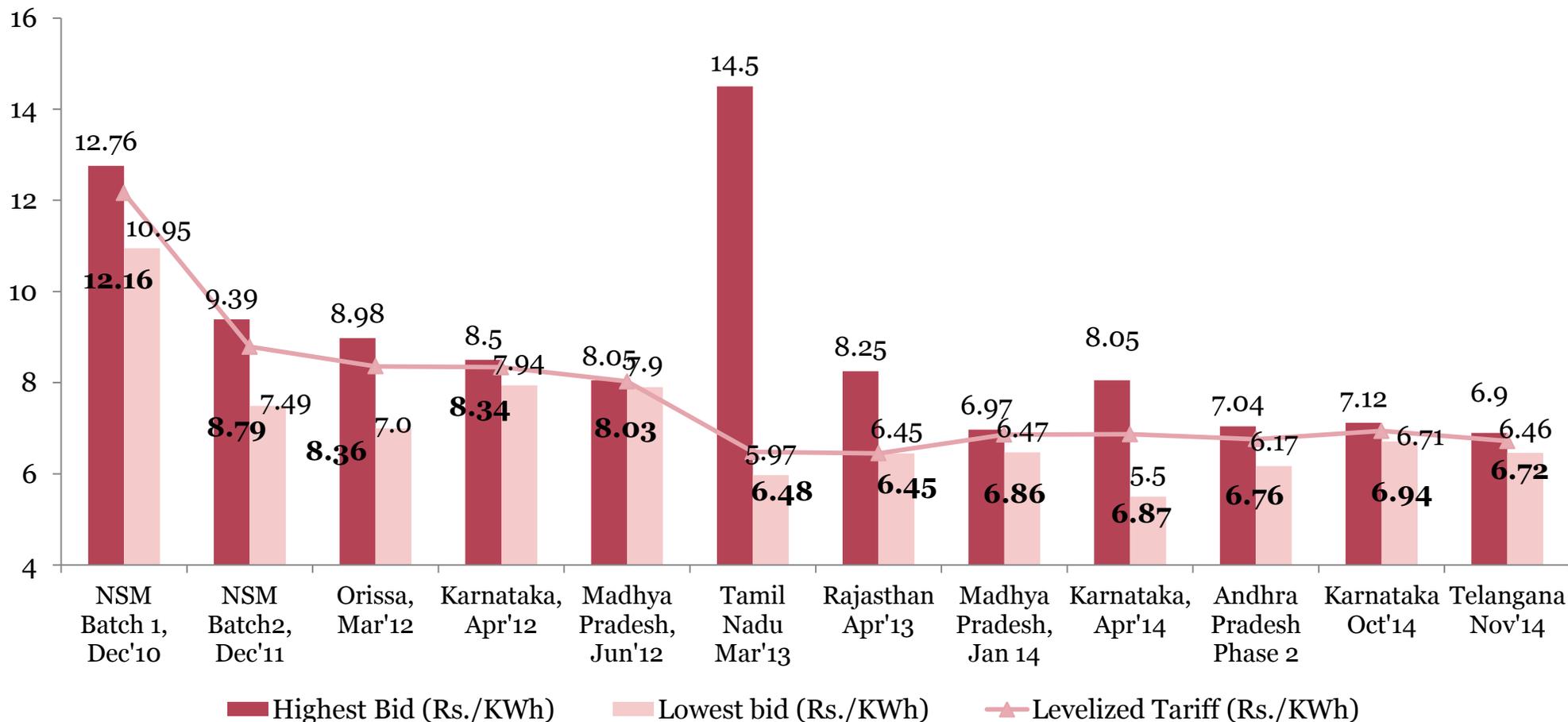
- Current Installed capacity of **22645** MW
- According to CWET, the wind power potential in India at 50 m hub-height is estimated to be **49,130 MW** and at 80 m hub-height is estimated to be **1,02,788 MW**

Growth path



Solar Power edging towards grid parity

Price of solar power has come down from Rs 17.91/kWh in 2010 to under Rs 7/kWh now.



- Analysis of tariffs suggest grid parity 3 years from now, as against anticipated in 2022 (JNNSM)
- CERC solar PV tariffs are Rs 6.91/kWh and Rs.7.72/kWh with and without accelerated depreciation benefit respectively for the FY 2014-15

Solar Scale-up Plans- 100 GW Vision

Category 1. Rooftop Projects

40,000 MW

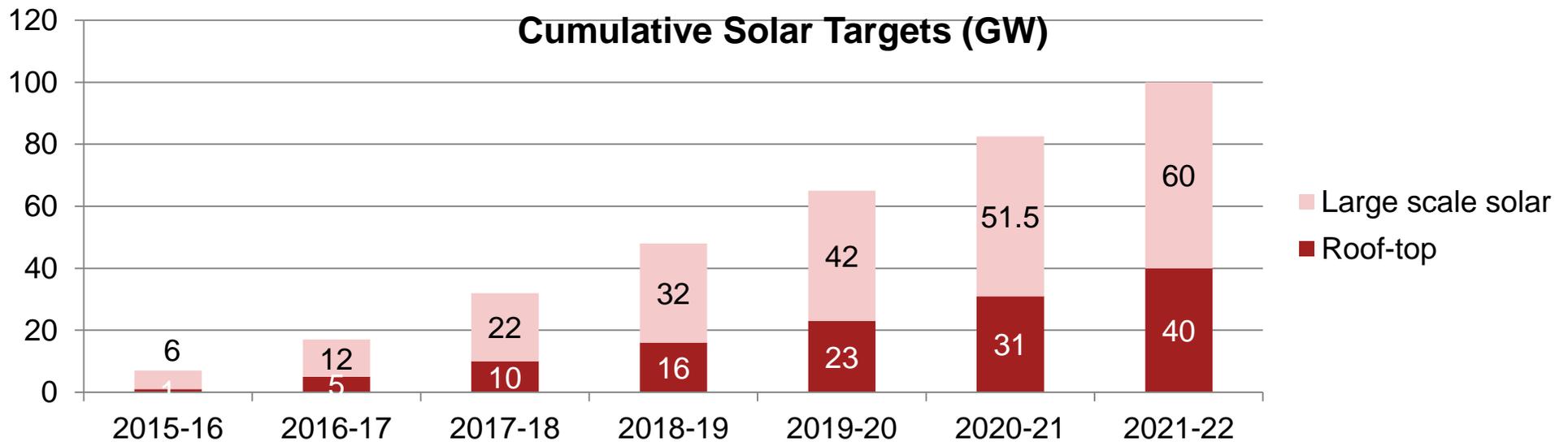


Category 2. Large scale Projects

Inside Solar park
20,000 MW



Outside Solar Park
40,000 MW



40 GW through grid connected rooftop



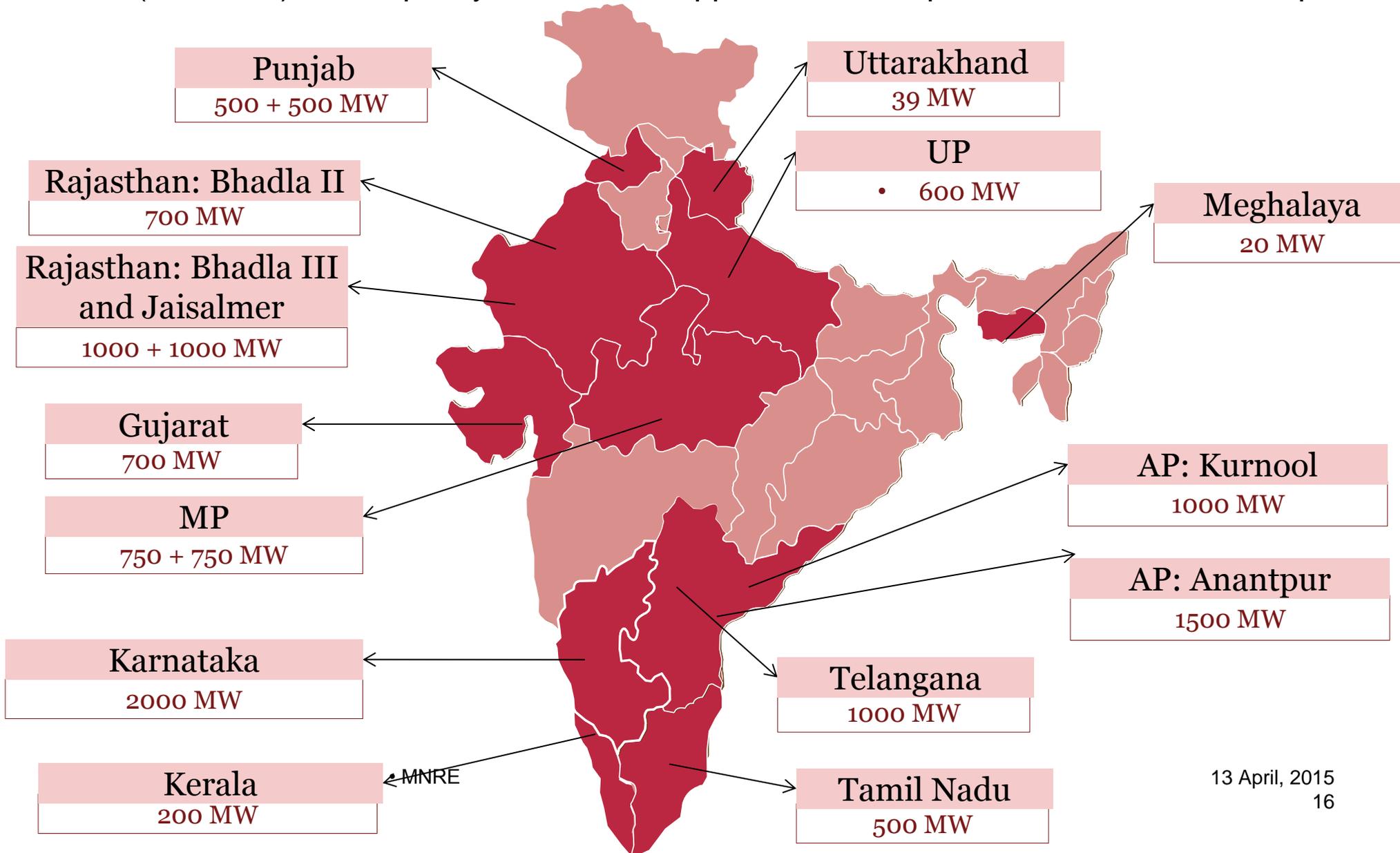
Status	358 MW Projects sanctioned and 41 MW installed [Potential for 124 GW exists]
Target	40,000 MW by 2022 of which 10 GW during 2015-16 to 2017-18.
Current support	Financial assistance of 15% of the benchmark [Reduced from 30% earlier]

Updates:

- 14 States have rooftop provisions in their Solar Policy and 20 States/UTs have notified regulations
- Rooftop included under IPDS and guidelines issued
- Guidelines issued to include rooftop under housing loan and **9 banks** have issued instructions
- Central Electricity Authority (CEA) has notified technical standards for connectivity and metering

20 GW through Solar park and UMPPs

17 Parks (12 states) with capacity 12,759 MW approved and request received for 5 more parks



20 GW from Unemployed youth, MSME, Gram panchayats

Size

- 0.5 MW to 5.0 MW in multiples of 100 kW
- Target: 20 GW in 5 years

MNRE Support

- Facilitate Loans: Equity support
- State Govt. may provide additional grants

Scheme

Beneficiaries

- Unemployed Graduates either alone or in partnership
- Gram Panchayats, Existing MSMEs

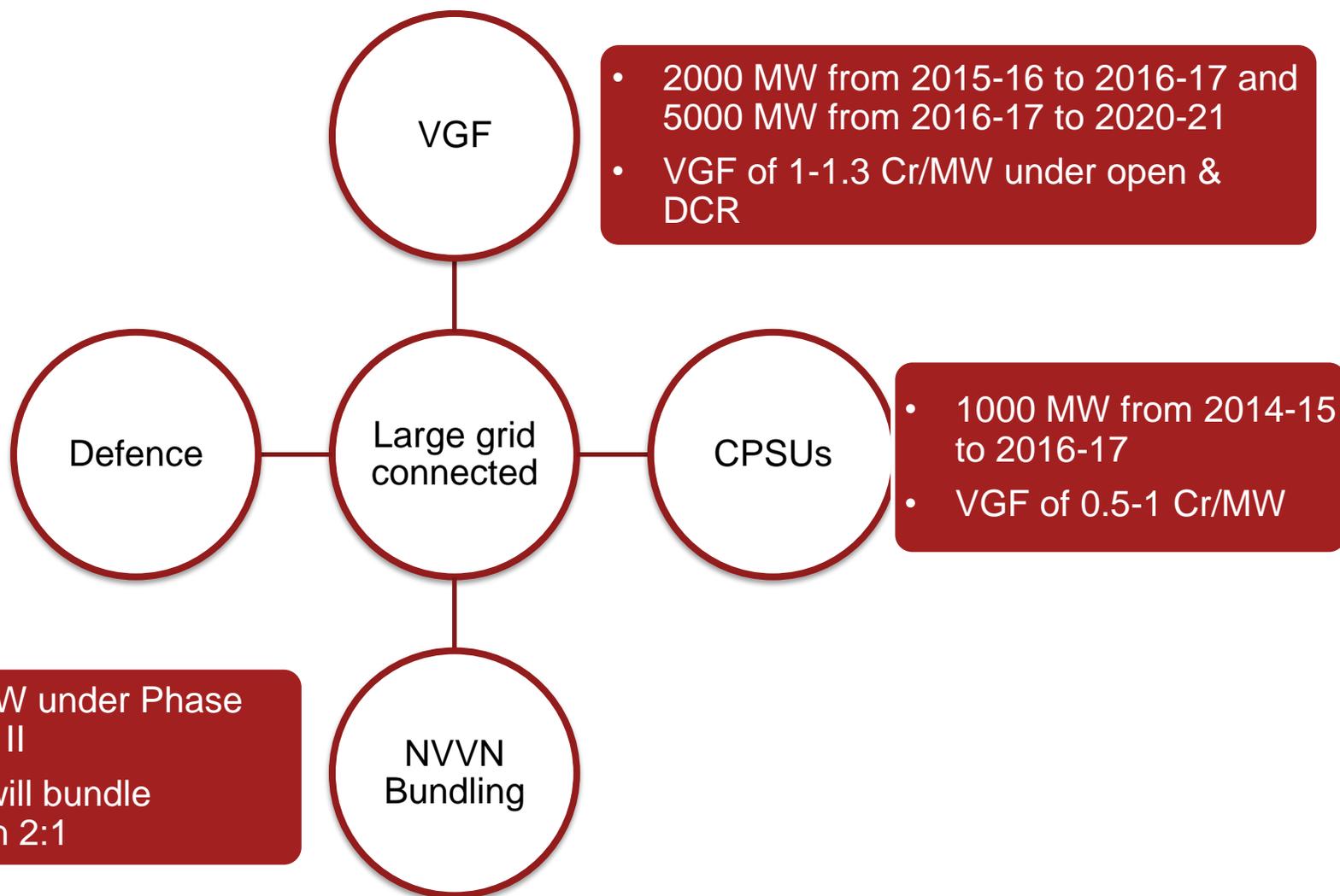
Implementing agency

- SECI on behalf of MNRE
- State governments to implement scheme

Key Benefits

- Utilization of sub-stations with spare capacities & additional power for states
- Employment to almost 20,000 unemployed youth
- Additional grant from states will bring down the cost of power

11.3 GW through Grid connected (VGF+NVVN)



Solar Programme

S. No.	Policies/Programmes	Capacity	Status
1	Grid-Connected Solar PV Power Projects by Defence Establishments under Ministry of Defence and Para Military Forces	300 MW (with DCR)	150 MW capacity allocated to Ordnance Factory Board. Rs. 100 Cr. from NCEF to be released during 2015-16. 200 MW likely to be sanctioned. (25% of advance is admissible. Some may claim 02 nd and 03 rd installment also.)
2	Grid Connected Solar PV Power Projects by central Public Sector Undertakings (CPSUs)	1000 MW (with DCR)	200 MW allocated to M/o Railways. 250 MW to NTPC 50% of 500 MW i.e. Rs. 250 Cr. needed in 2015-16. All likely to be sanctioned.
3	Setting up of Solar Parks and Ultra Mega Solar Power Parks (25 Nos.)	20,000 MW	Cabinet approved the Scheme on 10-12-2014. In-principle approval for setting up of 19 Solar Parks of 12,899 MW accorded and Rs. 172.5 Cr. released.
4	Grid Connected Solar PV Projects under Bundling Mechanism with unallocated Conventional power	15000 MW (2500 MW with DCR) (Tranche-I: 3000; Tranche-II: 5000; Tranche-III: 7000)	The scheme will be implemented by NVVN Ltd. wherein 3000 MW of solar power will be bundled with 1500 MW of unallocated conventional thermal power available with Ministry of Power. The projects will be allocated through a transparent bidding process for which the Ministry will be bringing out guidelines. The Cabinet note in this regard has already been sent to the Cabinet Secretariat on 09.02.2015.

Solar Programme

S. No.	Policies/Programmes	Capacity	Status
5	Pilot-cum-Demonstration Project for Development of Grid Connected Solar PV Power Plants on Canal Banks (50 MW) and Canal Tops (50 MW)	100 MW	Approval of Hon'ble Finance Minister accorded. In-principle approval issued to 6 States for setting up of solar PV projects on canal banks (35 MW)/canal tops (34 MW). Rs. 61.8 Cr. released.
6	Grid Connected Solar PV Power Projects with VGF	750 MW (375 MW with DCR)	Projects allocated, Scheme under implementation. PSA for 440 MW signed. Rs. 200 Cr. from NCEF not released for 2014-15. Rs. 1000 Cr. needed in 2015-16.
7	Grid Connected Solar PV Power Projects with VGF	2000 MW (some quantity with DCR proposed)	This scheme will be implemented by Solar Energy Corporation of India through a transparent bidding process where the initial and final tariff will be fixed and the bidders will be asked to quote for minimum annual increment on tariff.
8	Scheme for solar power driven agriculture pump sets and water pumping stations for energizing one lakh pumps.	1,00,000 Nos.	Out of targeted 1 lakh pumps, 15,330 are allocated to Ministry of Drinking and Water Supply, 54,394 to State Nodal Agencies and remaining 30,000 to NABARD for innovative implementation. 19 States have confirmed the given target and 54,394 numbers of solar pumps were sanctioned and Rs. 139.67 Cr. were released as advance. In addition, Rs. 120 Cr. released to NABARD to start the programme through Banks. Rs. 19.83 Cr. were released to 15 States for Drinking Water Pumps.

States to whom approval accorded for setting up Solar Power Park/Ultra Mega Solar Power Projects

Sl. No.	State	Capacity (MW) & No. of Solar Parks	Area of land identified at	Name of the implementing Agency	Transmission system declared as ISTS	ISTS declaration under consideration
1.	Gujarat	One park of 700 MW	1407 hectares at Vav, Distt. Banaskantha	GPCL	Declared	-
2.	Andhra Pradesh	Two parks of 1500 MW & 1000 MW	4251 hectares in N P Kunta, Anantpuramu & Kadapa districts 2250 hectares in Pinnapura, Panyam Mandal, Kurnool Distt.	AP Solar Power Corporation Pvt. Ltd. -JV Company floated by SECI, APGENCO and NREDCAP	Declared	-
3.	Uttar Pradesh	One park of 600 MW	1038 hectares at Jalaun, Sonbhadra, Allahabad & Mirzapur districts	JVC between UPNEDA and SECI.	Declared	-
4.	Meghalaya	One of 20 MW	27 hectares at West Jaintia Hills & East Jaintia Hills districts	Meghalaya Power Generation Corporation Ltd (MePGCL)	Declared	-
5.	Rajasthan	Three parks of (i) 700 MW (ii) 1000 MW & (iii) 1000 MW	1797.45 hectares at Bhadla Phase II 2000 hectares at Bhadla Phase III 2000 hectares at Jaisalmer Phase I	(i) Rajasthan Solar Park Development Company Ltd. (RSDCL), a subsidiary of RRECL. (ii) & (iii) Surya Urja Company of Rajasthan Ltd; a JVC between RRECL and IL & FS.	For 700 MW Solar Power Park at Bhadla	For 1000 MW at Bhadla and 1000 MW at Jaisalmer

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6.	Madhya Pradesh	Two parks of 750 MW each	1400 hectares at Rewa 800 & 600 hectares at Neemuch & Agar respectively	JVC of SECI and MPUVNL.	Declared	-
7.	Karnataka	One park of 2000 MW each	2429 hectares at Pavagada taluk, Tumkur dist.	JV of SECI and KREDAL.	Declared	-
8.	Tamil Nadu	One park of 500 MW	568 hectares at Ramanathapuram distt.	To be finalised	Evacuation by STU	
9.	Punjab	Two parks of 500 MW each	6167 acres at Patiala, 1786 acres at Fatehgarh Sahib 2311 acres at Ludhiana and 2790 acres at Gurdaspur	PEDA	Evacuation by STU	
10.	Telangana	One park of 1000 MW	5408 acres at Gattu, Mehboob Nagar Distt.	SECI, Telangana GENCO and Telangana New & Renewable Energy Development Corporation Ltd. (TNREDC)		Under Consideration
11.	Kerala	One park of 200 MW	4858 hectares in Paivalike, Meenja, Kinanoor, Kraindalam and Ambalathara villages of Kasargode district	SECI. Approval issued on 19/03/2015.		
12.	Uttarakhand	One park of 39 MW	77.853 hectares in Almora district	To be finalised. Approval issued on 20/03/2015.		
13.	Arunachal Pradesh	One park of 100 MW	2700 acres of waste land Digaru Paya region in Sonpura circle of Lohit district	Arunachal Pradesh Energy Development Agency (APEDA). Approval issued on 29/04/2015.		

Sl. No.	State	Capacity (MW) & No. of Solar Parks	Area of land identified at	Name of the implementing Agency	Transmission system declared as ISTS	ISTS declaration under consideration
14.	Nagaland	One park of 60 MW	Dimapur, Kohima and New Peren districts	Directorate of New & Renewable Energy, Nagaland. Approval issued on 29/04/2015.		
15.	J&K	Two UMSPP: 2500 MW (Kargil) & 5000 MW (Leh)	Kargil & Leh	<p>Status:</p> <ul style="list-style-type: none"> In the latest meeting held on 30th April, 2015, it was decided that the 7500 MW capacity could be achieved in two stages, considering setting up of 1500 MW capacity at Leh and 500 MW at Kargil districts in first phase and balance in next phase. PGCIL will construct the transmission systems from Leh to Srinagar and from Kargil to Srinagar for evacuation of power from the 1500 MW solar power project in Leh and 500 MW solar power project in Kargil. Principle Secretary, J&K Govt. mentioned that for 1500 MW solar capacity at Leh and 500 MW at Kargil districts, land could be taken on lease, however, the Hill Council would need to be given some benefit in terms of lease rent etc. Secretary, MNRE emphasized that ten paise per unit of revenue from the power sold from the project along with lease rent of the land may be considered to be given to the Hill Council. <p>It was emphasized that to begin with, 5 MW of solar power projects may be set up each at Leh and Kargil, so that all the issues that may arise could be resolved with regard to land, selection of solar power developer for setting up of 5 MW solar projects each at Leh and Kargil, tariff of power to be sold to J&K Power Development Department-Distribution (JKPDD) for local consumption.</p>		

Punjab Engineering College, Sector – 1, Chandigarh



Government Hospital, Sector – 16, Chandigarh



Govt. College for Girls, Sector – 11, Chandigarh



Reliance 100 MW Solar CLFR Plant in Rajasthan



Godawari 50 MW in Pokharan, Rajasthan



Solar Water Heaters

Park Sheraton, Chennai(40,000 liter/day)



The Taj Ambassador, Delhi (7000 LPD)



Sheraton Chola, Chennai (10,000 liter/day)



Gujarat Solar Park- Charanka



150 MW in Neemuch, MP



Thank You

Dr. Arun K Tripathi
Sr. Director
Ministry of New and Renewable Energy