

Maharashtra: More Industrialization Less Solarization

Dr. Sudhir Kumar
Chief Executive
Green Energy Solutions, Pune

Mob: +91 96650 20206
drsk22@gmail.com

Economic Survey of Maharashtra 2016-17

- ❖ **Maharashtra: The most industrialised state**
- ❖ **As on November 2016:**
 - ❖ **Total 19,437 industrial proposals**
 - ❖ **Rs. 11,37,783 crore investment**
 - ❖ **Highest in the country**
 - ❖ **8,664 projects (44.6 per cent) of Rs. 2,69,814 crore (23.7 per cent) commissioned**
 - ❖ **Generating about 11.45 lakh employment**
 - ❖ **Around 2,107 projects with an investment of Rs. 87,701 crore (employment 2.98 lakh) under execution**

Source Wise Installed Capacity (MW)

Source	As on 31 st March		
	2014	2015	2016
In the State	29,556	31,291	32,332
Thermal	17,206	18,436	19,216
Renewable	6,172	6,717	6,978
Hydro	3,066	3,066	3,066
Natural Gas	3,112	3,072	3,072
Central sector allocation	6,627	6,627	7,026

Renewable's Capacity Addition: Small

Source Wise Electricity Generated (MUs)

Source	2013-14	2014-15	2015-16
In the State	91,987	1,03,779	1,13,787
Thermal	71,686	84,882	94,482
Natural Gas	6,055	4,626	5,302
Hydro	6,763	5,856	5,045
Renewable ^s	7,483	8,415	8,958
Received from central sector	31,525	30,401	29,179

Dismal Renewable's Progress?

RE Potential and Installed Capacity (MW)

Source	Potential	Installed capacity		
		As on 31 st March		
		2014	2015	2016
Wind	9,400	4,080	4,444	4,662
Bagasse co-generation	2,500	1355	1,415	1,415
Small Hydro Projects (SHPs) [#]	824	288	294	302
Biomass	1,887	190	200	200
Urban Waste to energy	287	3	3	3
Industrial Waste	350	26	32	34
Solar	64,320	230	329	362
Total	79,568	6,172	6,717	6,978

Very Large Potential of Solar Untapped

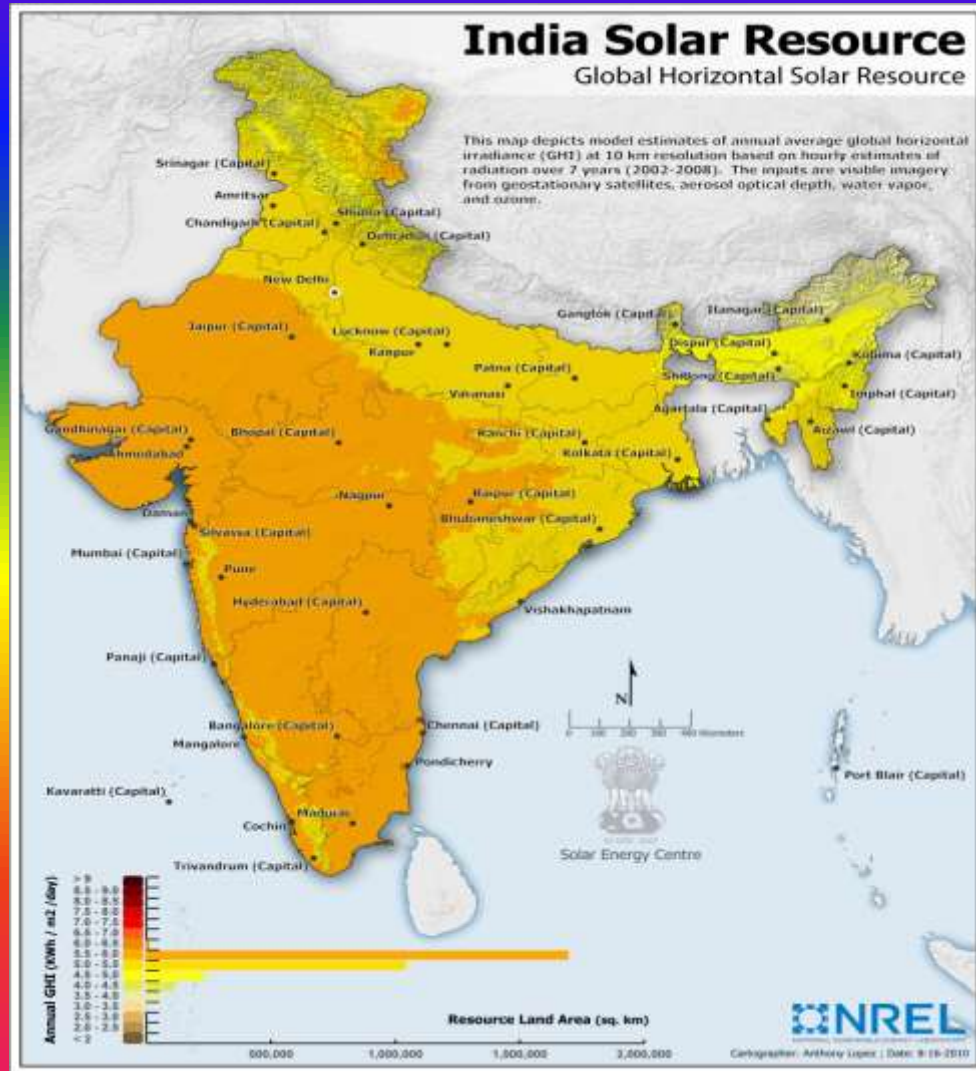
Solar Potential Assessment in Maharashtra MW

- A Study by World Institute of Sustainable Energy, Pune
- Based on % of waste land utilization pattern
- Maharashtra total ground area: 307690 Sq.km.
- Maharashtra total wasteland available: 49275 Sq.km.

S.N.	Solar Technology	Potential with 1% land availability (MW)	Potential with 2% land availability (MW)	Potential with 3% land availability (MW)	Potential with 4% land availability (MW)	Potential with 5% land availability (MW)
1	SPV	24145	48290	72435	96580	120725
2	CSP	17246	34493	51739	68986	86232

Solar Radiation Map 1/2

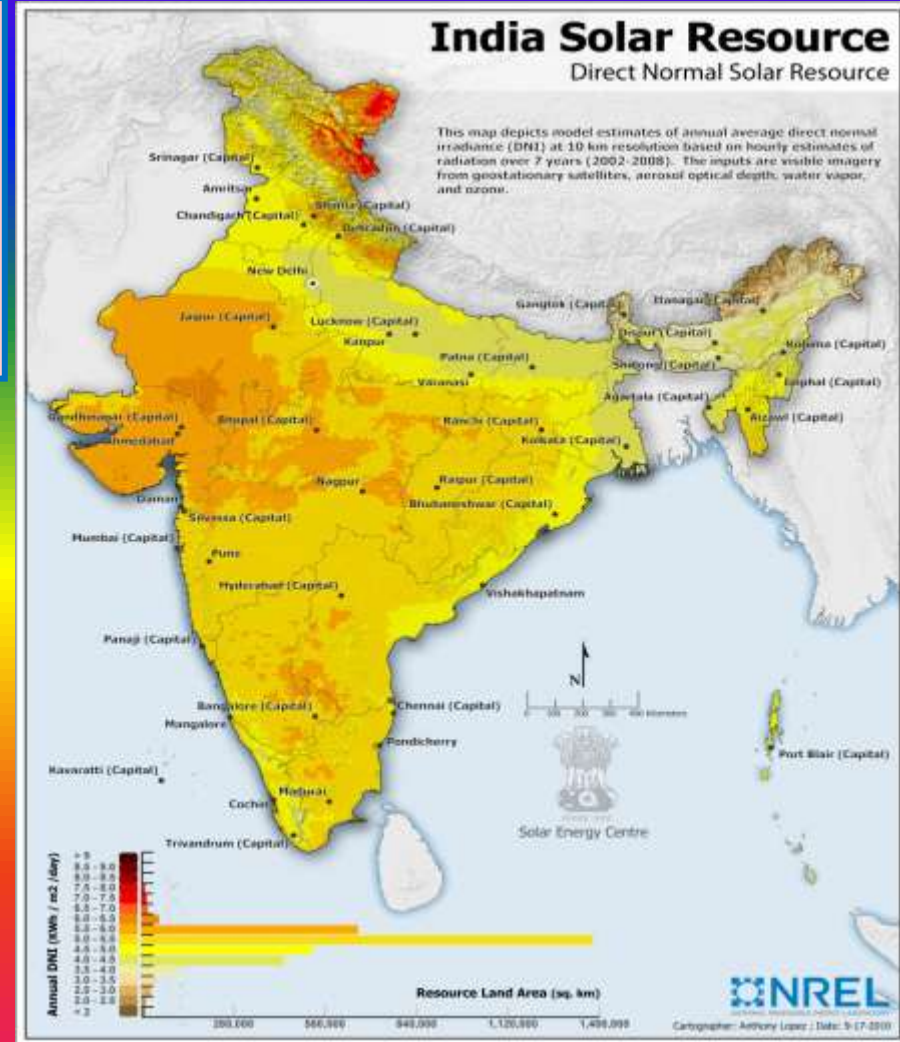
- ❖ Global horizontal irradiance (GHI):
Pyranometer
- ❖ Total: Direct + Diffuse
- ❖ Useful for PV



Ideal: > 1500 kWh/m²/yr, Maharashtra: > 2000 kWh/m²/yr (Good)

Solar Radiation Map 2/2

- ❖ **Direct Normal Irradiance (DNI): Pyrheliometer**
- ❖ **Direct on perpendicular surface**
- ❖ **Useful for Reflectors, CSP**



Ideal: > 1800 kWh/m²/yr, Maharashtra: > 1900 kWh/m²/yr (Avg.)

A Case for Solar: Highest Tariff (2016-17)

Category of user	MAHADISCOM
LT - Domestic/Residential	
BPL	1.48
0-100 Units	4.78
101-300 Units	8.45
301-500 Units	11.43
500-1,000 Units	12.99
Above 1,000 Units	14.24
LT - Commercial/Non-Residential	
(a) 0-20 kW	10.25
(b) > 20 kW & ≤ 50 kW	13.18
(c) Above 50 kW	16.12
LT - Industry	
(a) below 20 kW load	6.33
(b) above 20 kW load	9.17

Even Residential Rs. 14/ Unit, Commercial Rs. 16/Unit ??

A Case for Solar: Highest Tariff (2016-17)

LT - Agriculture	
(a) Un-Metered – Pumpsets	3.77
(b) Metered – Pumpsets	3.17
(c) Metered – Others	4.79
LT - Street Lights (Public lighting)	
(a) Grampanchayat and A, B & C class Municipal Councils	5.43
(b) Municipal Corporation areas	6.70
LT - Public Services	
(a) Government Educational Institutions and Hospitals	8.62
(b) Others	8.95
HT - Industry	8.57
HT - Railways / Metro / Monorail	9.18

Agriculture Rs. 3-4/ Unit ?? (Cross Subsidy)

Is It Problem of Plenty?

Supply & shortfall of electricity at average peak demand

Year	Average peak demand	Supply	Shortfall (MW)
2012-13	14,032	13,309	723
2013-14	14,406	13,830	576
2014-15	15,812	15,392	420
2015-16	15,948	15,850	98
2016-17 ⁺	16,304	16,304	0

Source: MAHADISCOM + upto December

No Supply and Demand Gap?

Future Expansion Overlooked: Laxity

- ❖ **Around 10,000 approved industrial proposals are work in progress**
- ❖ **Sudden energy demand likely to rise**
- ❖ **Other sectors e.g. Commercial and Domestic sectors' demand may also rise**
- ❖ **Coal and gas sectors are in trouble**
- ❖ **Thermal power expansion no more viable**
- ❖ **Solar power is the only option since:**
 - ❖ **Technically matured**
 - ❖ **Commercially viable**
 - ❖ **Large potential untapped**
 - ❖ **Available everywhere**

Basic Issues

Governmental Issues

- ❖ **Lack of Political Will**
 - ❖ **No Prioritisation (Solar on back burner)**
 - ❖ **No State Vision (Guided by Central Govt.)**
- ❖ **Delayed Solar Policy**
 - ❖ **Karnataka , Gujarat (2009)**
 - ❖ **Maharashtra (2015)**
- ❖ **Policy Uncertainty**
 - ❖ **No strict sunset date (Investment Deterrent)**
 - ❖ **Tenders unprotected against cancellation**
- ❖ **Weak Energy Agency**
 - ❖ **No dedicated manpower (small team)**
 - ❖ **No robust IT base (online bid, transparent, faster)**
 - ❖ **Sanctioning and implementing agency mixed (good example GEDA vs GPCL)**

Regulatory and Legal Issues

- ❖ **Poor RPO implementation**
 - ❖ Obligated entities practically not obliged
 - ❖ RE neglected in 'Level Playing Field'
- ❖ **Troublesome net metering regulation**
 - ❖ Net metering timeline not honored
 - ❖ No rooftop RPO (?)
 - ❖ Limit of Rooftop capacity 1 MW (Removed?)
- ❖ **Lack of teeth**
 - ❖ Govt and MERC both helpless (no penal provision)
 - ❖ No RE or Sustainability Act?
 - ❖ Citizen's fundamental right for Clean – Air, Water and Energy is missing
- ❖ **Restriction on OA and Captive solar power**
 - ❖ Rs. 4/unit additional charges to OA (Unviable)
 - ❖ Parallel operation charges and back-up charges high

Role of Solar Association

- ❖ **Work for larger cause of the country**
 - ❖ **Guardian of solar business and consumers**
 - ❖ **Advocacy, canvassing and campaigning**
 - ❖ **Not just in words, but in deeds**
- ❖ **The deeds:**
 - ❖ **File petition to MERC for:**
 - ❖ **Net metering timeline not being honored**
 - ❖ **Including portion of rooftop in the SPO**
 - ❖ **Removal of 1 MW cap for rooftop (if not done)**
 - ❖ **Issuing conducive OA and Captive solar power regulation**
 - ❖ **Submit draft of "The Maharashtra Sustainability Act" to make clean air, water and energy as every citizen's fundamental right**

THANK YOU

**Dr. Sudhir Kumar, Chief Executive,
Green Energy Solutions,**

8/15, Mazda Deluxe Homes, Porwal Park, Tank Road,
Off: Alandi Road, Yerwada, Pune - 411006, India.
Cell No. +91-9665020206, E-mail: drsk22@gmail.com