

Energy Scenario in India

RENEWABLE ENERGY POTENTIAL IN INDIA

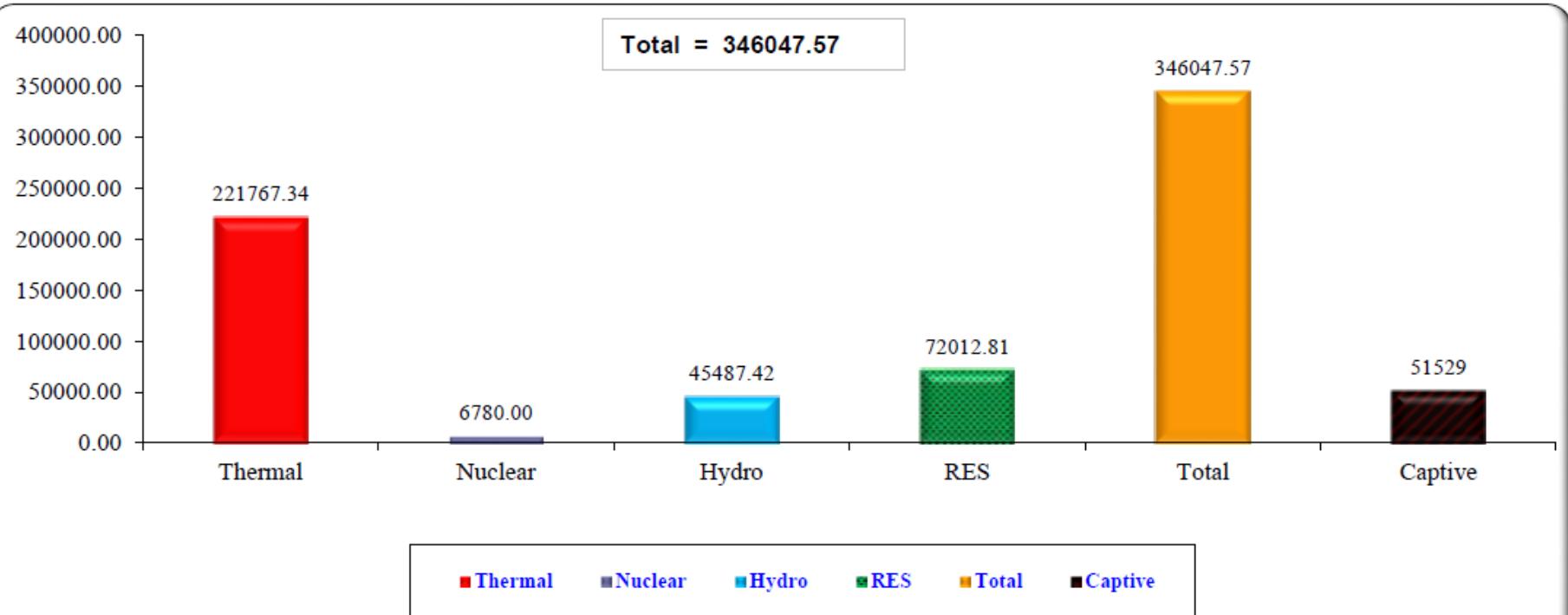
SL NO	SOURCE /TECHNOLOGY	POTENTIAL
1.	Biogas Plants	12 Million
2.	Biomass based Power	17,000 MW
3.	Efficient Woodstoves	120 Million
4.	Solar Energy	5x10 ¹⁵ kWhr/year
5.	Small Hydro	10,000 MW
6	Wind Energy	50,000 MW
7.	Energy from Urban and Industrial Waste	1,700 MW
8.	Ocean Thermal	50,000 MW
9.	Sea Wave Power	20,000 MW
10.	Tidal Power	10,000 MW
SPV – Solar Photovoltaic SWH – Solar Water Heater SC – Solar Cooker		

Total Installed Capacity

(as on 30/11/2018)

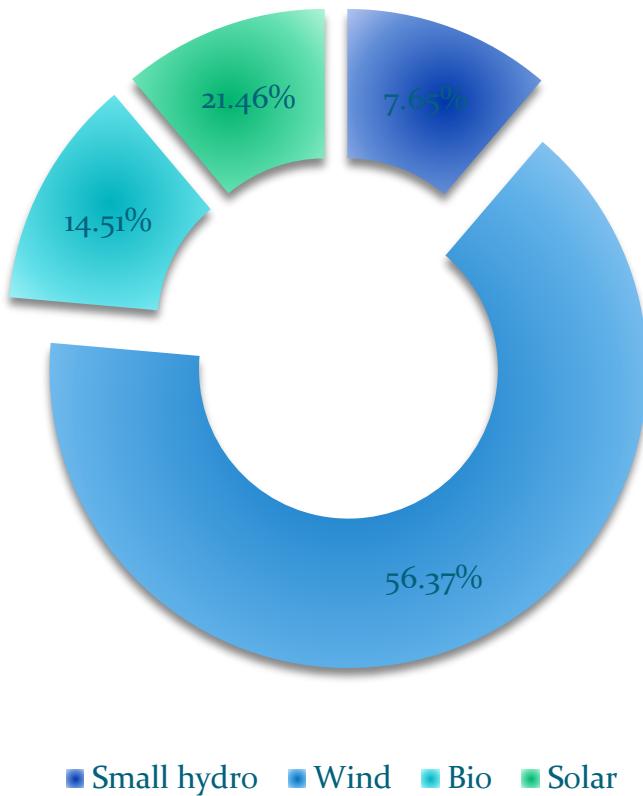
Fuel	Installed capacity(MW)	% of Total Installed capacity
Total Thermal	2,21,768	64.10%
Coal	1,95,993	56.6%
Gas & liquid	24937	7.2%
Diesel	838	0.2%
Hydro (Renewable)	45,487	13.1%
Nuclear	6780	2.0%
RES** (MNRE)	72,103	20.8%
Total	346048	100.00%

Installed Capacity:



Renewable Energy installed Power Capacity

as on 30/11/2018



■ Small hydro ■ Wind ■ Bio ■ Solar

Wind Power	Small Hydro Power	Bio-Power		Solar Power	Total capacity
		Bio-Mass Power and cogeneration	Waste to Energy		
34615.10	4506.95	8730.80	138.30	24021.66	72012.81

Sector wise power generation:

Region	Ownership/ Sector	Modewise breakup								Grand Total	
		Thermal					Nuclear	Hydro	RES * (MNRE)		
		Coal	Lignite	Gas	Diesel	Total					
ALL INDIA	State	62966.50	1290.00	7118.71	363.93	71739.13	0.00	29878.80	1983.87	103601.80	
	Private	74316.00	1830.00	10580.60	473.70	87200.30	0.00	3394.00	68501.64	159095.94	
	Central	53010.00	3240.00	7237.91	0.00	63487.91	6780.00	12126.42	1527.30	83921.63	
	Total	190292.50	6360.00	24937.22	837.63	222427.34	6780.00	45399.22	72012.81	346619.37	

Power Supply Position (Peak Demand)

Region	Power (MW)				Surplus(+) /Deficit (-) in %	
	Peak Demand		Peak Met			
	Oct-2017	Oct-2018	Oct-2017	Oct-2018	Oct-2017	Oct-2018
Northern	51307	50659	50289	49635	-2.0	-2.0
Western	48530	56548	46392	55695	-4.4	-1.5
Southern	39142	45279	38905	45226	-0.6	-0.1
Eastern	19850	22959	19836	22567	-0.1	-1.7
North Eastern	2596	2790	2499	2700	-3.7	-3.2
All India	162027	172,945	157394	170,604	-2.9	-1.4

Electricity Generation

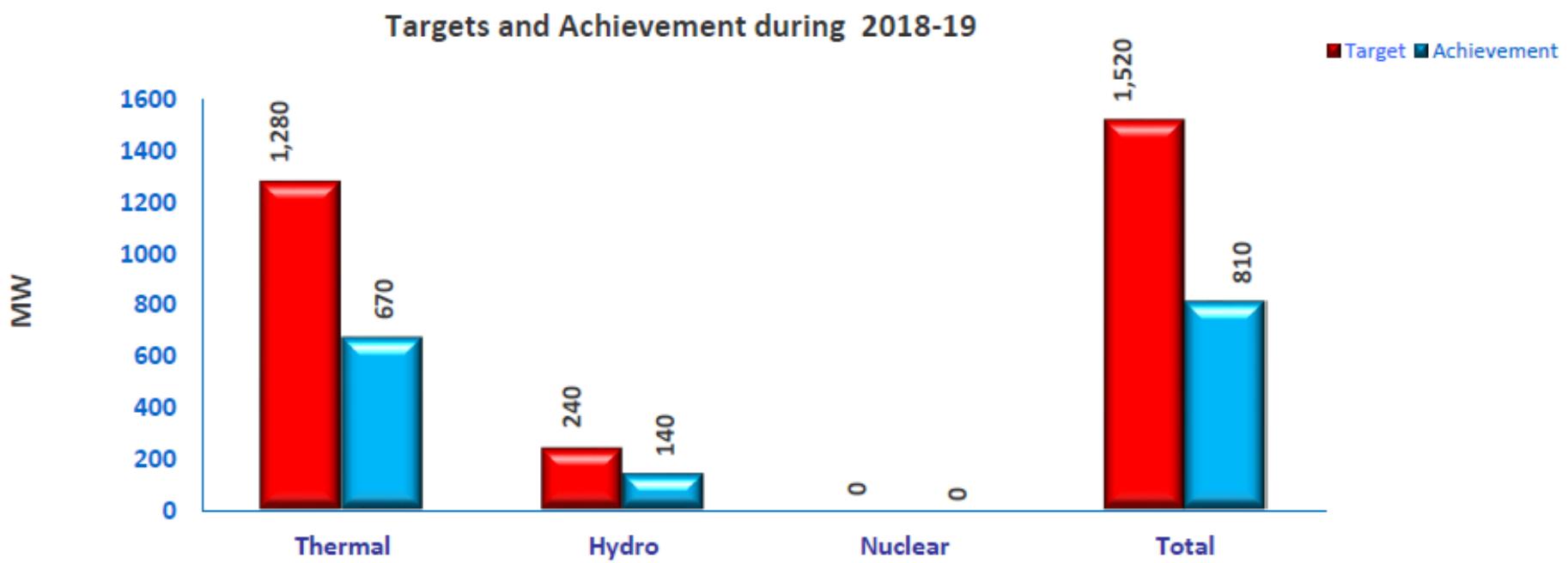
Electricity Generation (Conventional and Renewable Sources)

Oct-2018			Oct-2017			% Growth		
Generation from Conventional Sources*	Generation from Renewable Sources*	Total*	Generation from Conventional Sources	Generation from Renewable Sources	Total	Growth in Conventional Generation	Growth in Renewable Generation	Growth in Total Generation
(BU)	(BU)	(BU)	(BU)	(BU)	(BU)	(%)	(%)	(%)
113.366	8.500	121.866	102.879	6.537	109.416	10.19	30.03	11.38

All India Generation From Renewables (All Figures are in MU)

Sl.No.	Source-Wise All India Generation from Renewables	For the Month of		Cummulative for the period	
		Sep-2018	Sep-2017	April 2018- Sept 2018	April 2017- Sept 2017
1	Wind	6093.345	3897.076	45331.034	37069.611
2	Solar	3209.923	2002.513	17912.711	10811.454
3	Biomass	177.174	273.211	1382.764	1741.918
4	Bagasse	231.358	270.424	3154.629	2085.272
5	Small Hydro	993.983	1021.349	5335.933	4727.041
6	Others	32.159	24.319	209.731	173.991
Total :		10737.943	7488.892	73326.802	56609.286

Achievement of Capacity Addition during the Current Plan upto October 2018



Solar Energy

Growth of Solar Capacity in India (MW)

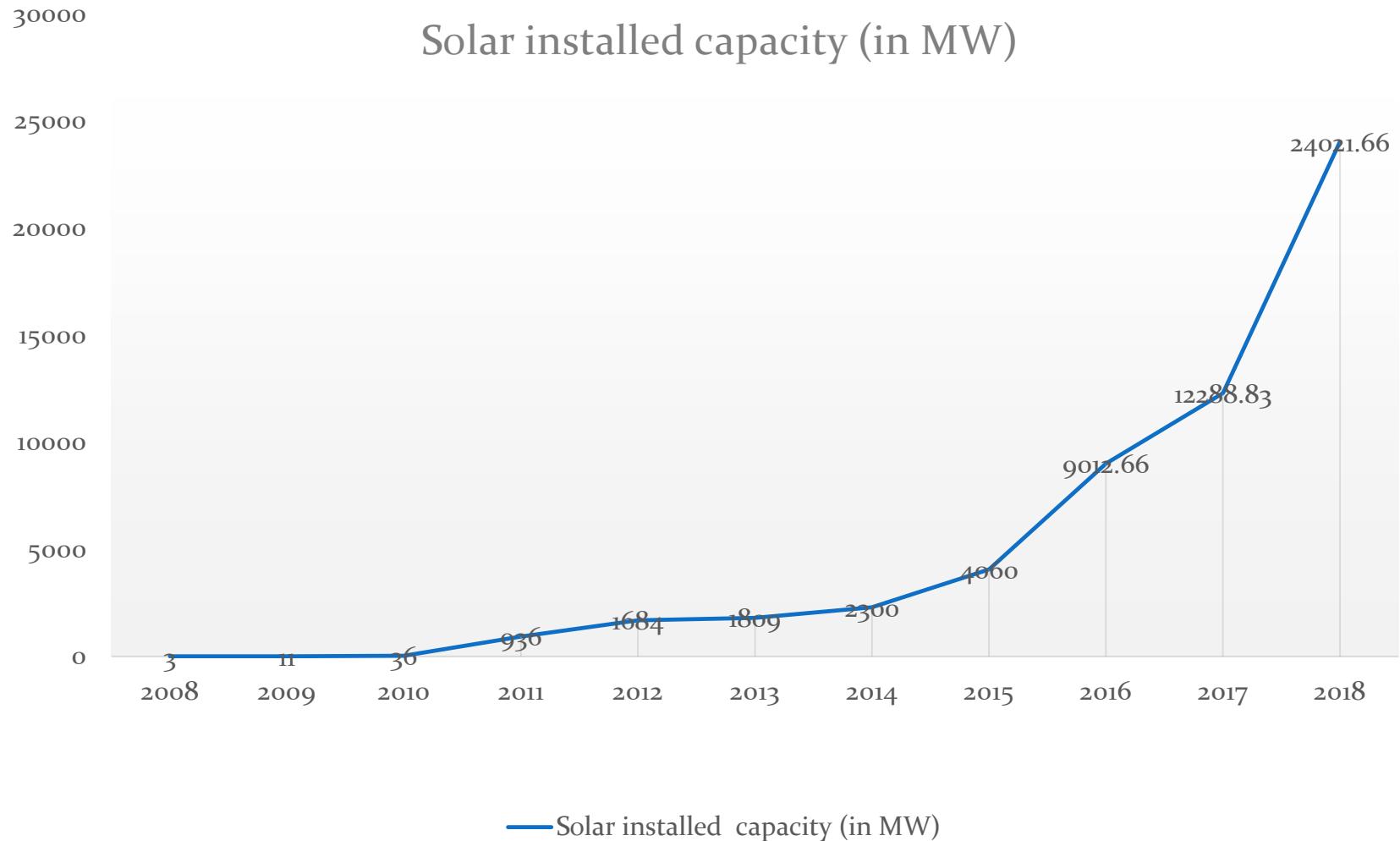


Table-4.2 Commissioning Status of Grid Connected Solar Projects

Sr. No.	State/UT	Total cumulative capacity (MW) as on 31-03-2017	Capacity commissioned in 2017-18 (MW)	Total cumulative capacity (MW) as on 31-12-2017
1	Andaman & Nicobar	6.56	6.05	12.61
2	Andhra Pradesh	1867.23	297.99	2165.21
3	Arunachal Pradesh	0.27	4.12	4.39
4	Assam	11.78	0.00	11.78
5	Bihar	108.52	33.00	141.52
6	Chandigarh	17.32	1.57	18.89
7	Chhattisgarh	128.86	50.52	179.38
8	Dadar & Nagar	2.97	0.00	2.97
9	Daman & Diu	10.46	0.00	10.46
10	Delhi	40.27	17.75	58.02
11	Goa	0.71	0.00	0.71
12	Gujarat	1249.37	95.32	1344.69
13	Haryana	81.40	122.45	203.85
14	Himachal Pradesh	0.73	0.75	1.48
15	Jammu & Kashmir	1.36	1.00	2.36
16	Jharkhand	23.27	0.00	23.27
17	Karnataka	1027.84	773.01	1800.85
18	Kerala	74.20	14.00	88.20
19	Lakshadweep	0.75	0.00	0.75
20	Madhya Pradesh	857.04	353.07	1210.11

21	Maharashtra	452.37	310.71	763.08
22	Manipur	0.03	1.30	1.33
23	Meghlya	0.01	0.05	0.06
24	Mizoram	0.10	0.10	0.20
25	Nagaland	0.50	0.00	0.50
26	Odisha	79.42	0.09	79.51
27	Puducherry	0.08	0.03	0.11
28	Punjab	793.95	111.69	905.64
29	Rajasthan	1812.93	497.53	2310.46
30	Sikkim	0.00	0.01	0.01
31	Tamil Nadu	1691.83	127.59	1819.42
32	Telangana	1286.98	1703.09	2990.07
33	Tripura	5.09	0.00	5.09
34	Uttar Pradesh	336.73	213.65	550.38
35	Uttarakhand	233.49	13.40	246.89
36	West Bengal	26.14	13.70	39.84
37	Other/MoR/PSU	58.31	0.00	58.31
TOTAL		12288.83	4763.54	17052.37

JNNSM - Mission Road Map

Application Segment	Target for Phase I (2010-13)	Cumulative Target for Phase 2 (2013-17)	Cumulative Target for Phase 3 (2017-22)
Grid solar power (large plants, roof top & distribution grid plants)	1,100 MW	4,000 - 10,000 MW	20,000 MW
Off-grid solar applications	200 MW	1,000 MW	2,000 MW
Solar Thermal Collectors (SWHs, solar cooking/cooling, Industrial process heat applications etc.)	7 million sq. meters	15 million sq. meters	20 million sq meters
Solar Lighting System	5 million	10 million	20 million

Wind Energy

Table - : Wind Power Potential in India

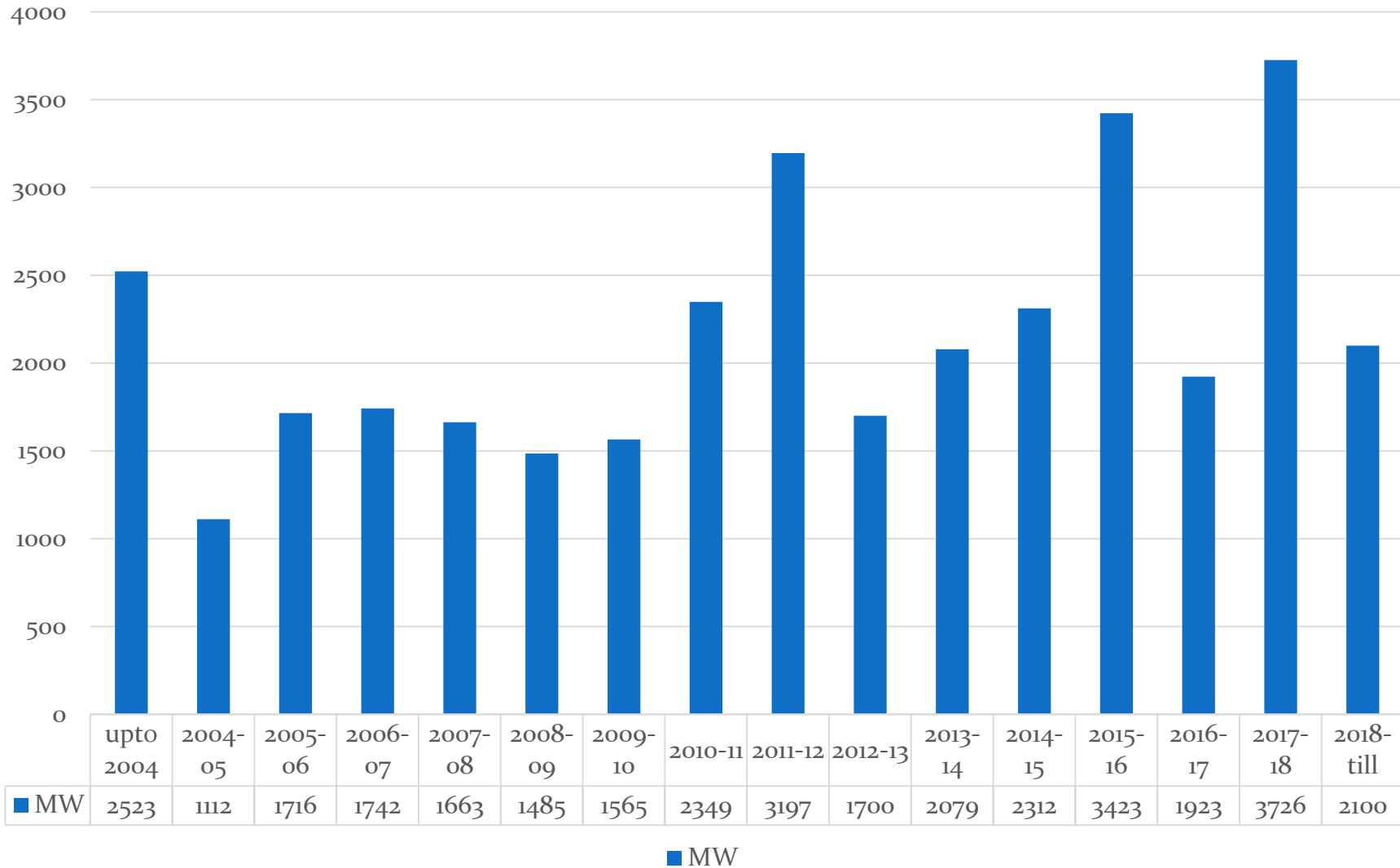
S.No	States / UTs	Indicative Installable Potential (MW)	
		@50m	@ 80 m
1	Andaman & Nicobar	2	365
2	Andhra Pradesh	5394	14497
3	Arunachal Pradesh*	201	236
4	Assam*	53	112
5	Bihar	-	144
6	Chhattisgarh*	23	314
7	Daman & Diu	-	4
8	Gujarat	10609	35071
9	Haryana	-	93
10	Himachal Pradesh *	20	64
11	Jharkhand	-	91
12	Jammu & Kashmir *	5311	5685
13	Karnataka*	8591	13593
14	Kerala	790	837
15	Lakshadweep	16	16
16	Madhya Pradesh	920	2931
17	Maharashtra	5439	5961
18	Manipur*	7	56
19	Meghalaya *	44	82
20	Nagaland *	3	16
21	Odisha	910	1384
22	Puducherry	-	120
23	Rajasthan	5005	5050
24	Sikkim *	98	98
25	Tamil Nadu	5374	14152
26	Uttarakhand *	161	534
27	Uttar Pradesh *	137	1260
28	West Bengal*	22	22
	Total	49130	102788

Table State-wise Wind Power Installed Capacity (MW) (upto 31.12.2016)

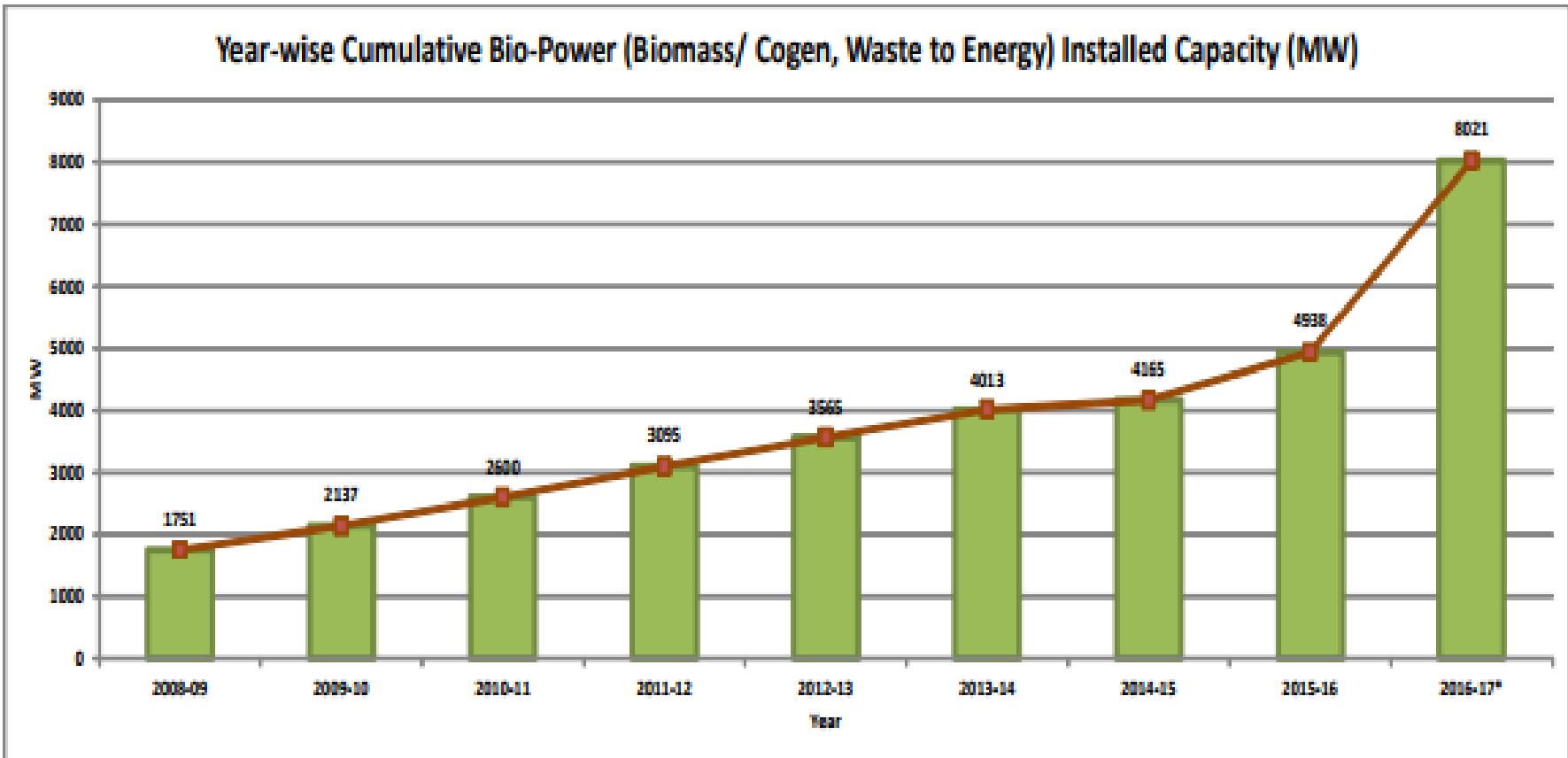
S. No.	State	Wind Power Installed Capacity(MW)
1.	Andhra Pradesh	2092.50
2.	Gujarat	4441.57
3.	Karnataka	3154.20
4.	Kerala	43.50
5.	Madhya Pradesh	2288.60
6.	Maharashtra	4666.03
7.	Rajasthan	4216.72
8.	Tamil Nadu	7694.33
9.	Telangana	98.70
10.	Others	4.30
	Total	28700.44

Growth of Wind installed Capacity in India (MW)

MW

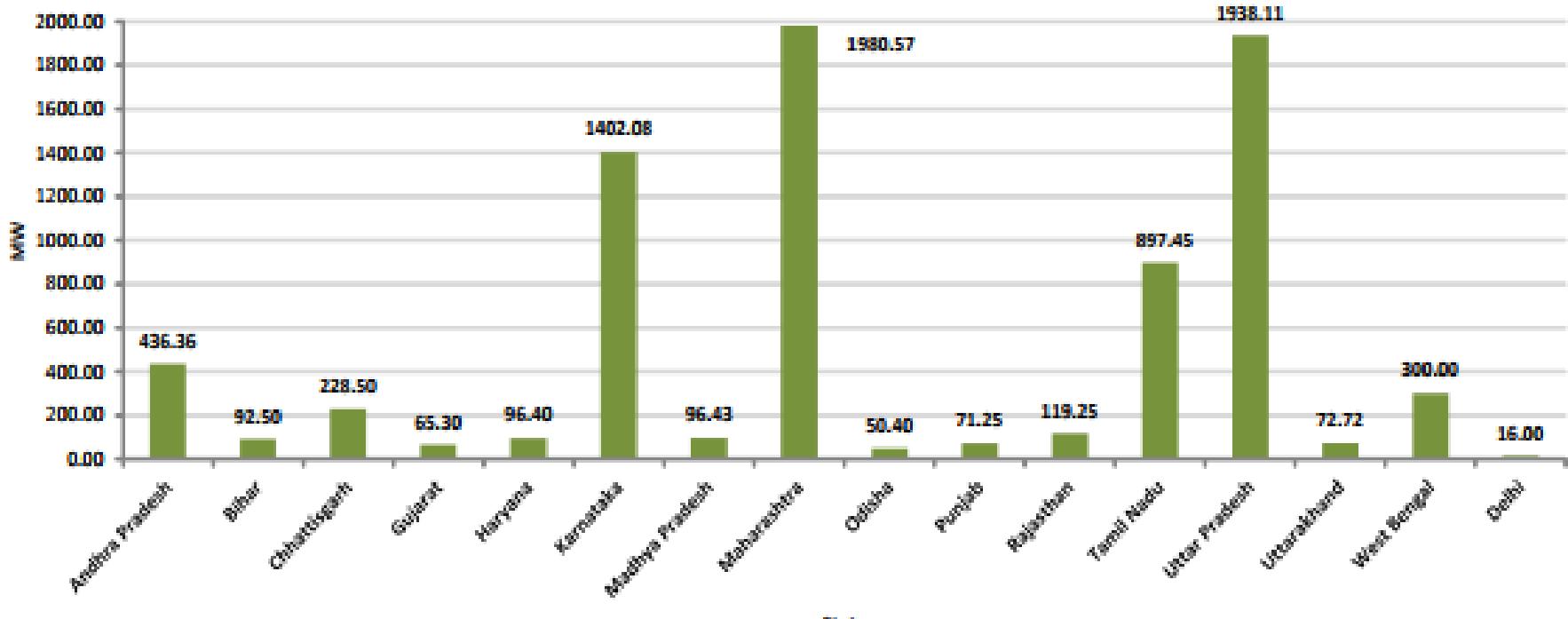


Growth of Biomass installed Capacity in India (MW)



State-wise Grid Interactive Bio-Power Installed Capacity (MW)

(Biomass/ Cogeneration and Waste to Energy)



* Data up to 31.12.2016

Table - State-wise details of Small Hydro Projects completed and under execution.

**STATE WISE NUMBERS AND AGGREGATE CAPACITY OF SHP
PROJECTS(UPTO 25 MW)**

POTENTIAL, INSTALLED & UNDER IMPLEMENTATION (as on 31.12.2016)

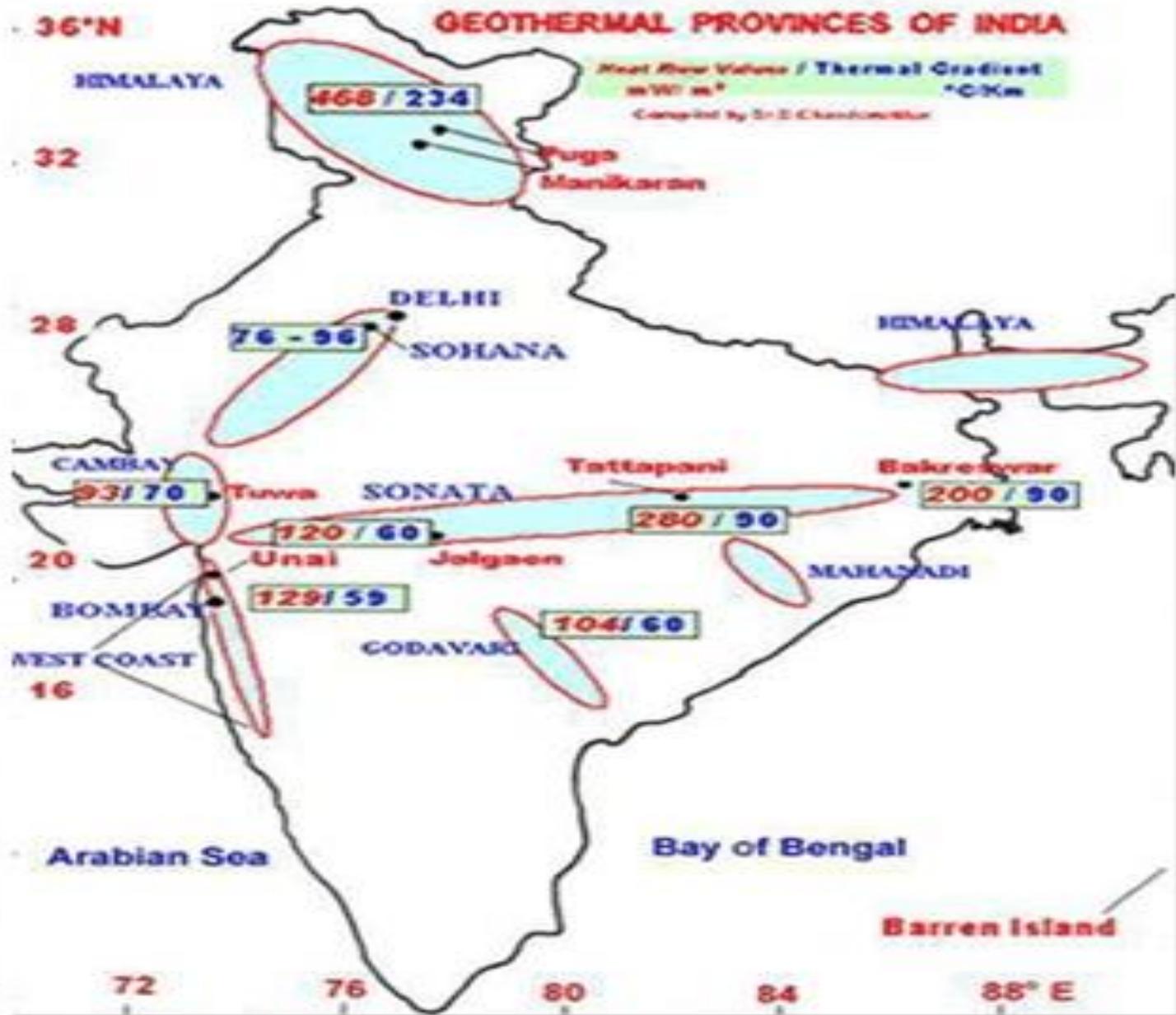
Sl. No.	State	Potential		Projects Installed		Projects under Implementation	
		Nos.	Total Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)
1	Andhra Pradesh & Telengana	387	978.4	72	241.98	5	17.7
2	Arunachal Pradesh	677	1341.38	152	104.605	17	54.05
3	Assam	119	238.69	6	34.11	5	33
4	Bihar	93	223.05	29	70.7	10	8.3
5	Chhattisgarh	200	1107.15	10	76	1	24
6	Goa	6	6.5	1	0.05	0	0
7	Gujarat	292	201.97	6	16.6	13	92.31
8	Haryana	33	110.05	9	73.5	1	0.1
9	Himachal Pradesh	531	2397.91	180	798.81	27	211
10	J&K	245	1430.67	40	158.03	25	45.15
11	Jharkhand	103	208.95	6	4.05	0	0
12	Karnataka	834	4141.12	166	1220.73	3	13.4
13	Kerala	245	704.1	31	205.02	9	74.015
14	Madhya Pradesh	299	820.44	11	86.16	0	0
15	Maharashtra	274	794.33	64	346.175	16	54.15
16	Manipur	114	109.13	8	5.45	0	0
17	Meghalaya	97	230.05	4	31.03	2	25.5
18	Mizoram	72	168.9	19	41.47	4	8.7
19	Nagaland	99	196.98	12	30.67	8	3.75
20	Orissa	222	295.47	10	64.625	3	18.5
21	Punjab	259	441.38	54	170.9	12	30
22	Rajasthan	66	57.17	10	23.85	0	0

23	Sikkim	88	266.64	17	52.11	2	15
24	Tamil Nadu	197	659.51	21	123.05	0	0
25	Tripura	13	46.86	3	16.01	0	0
26	Uttar Pradesh	251	460.75	9	25.1	1	1.5
27	Uttarakhand	448	1707.87	101	209.32	5	19.6
28	West Bengal	203	396.11	24	98.5	0	0
29	A&N Islands	7	7.91	1	5.25	0	0
Total		6474	19749.44	1076	4333.855	169	749.725

GEOOTHERMAL PROVINCES OF INDIA

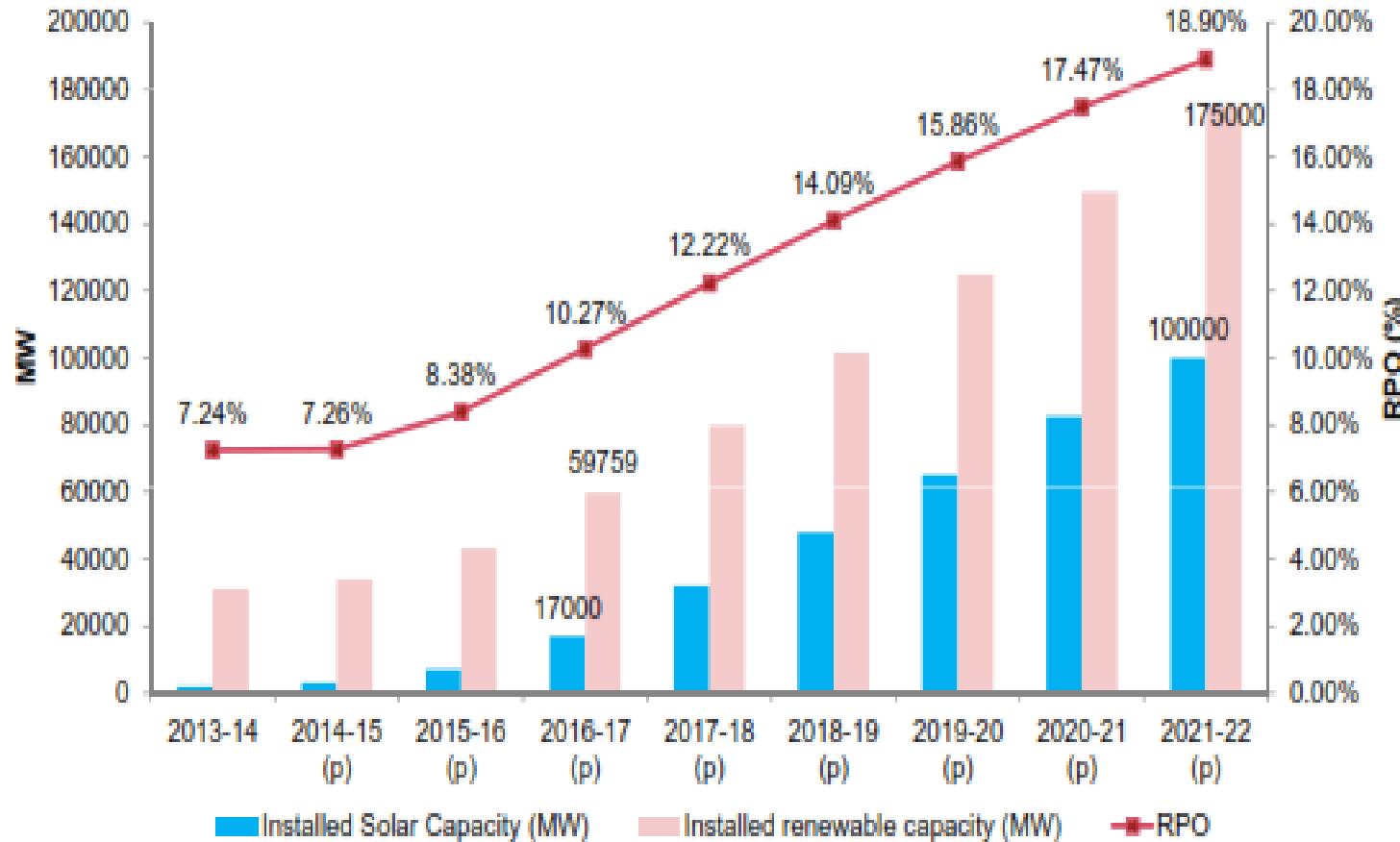
*Mount River Waters / Thermal Gradient
at 10°C m.⁻¹*

Compiled by Sri E. Chennaprasadarao

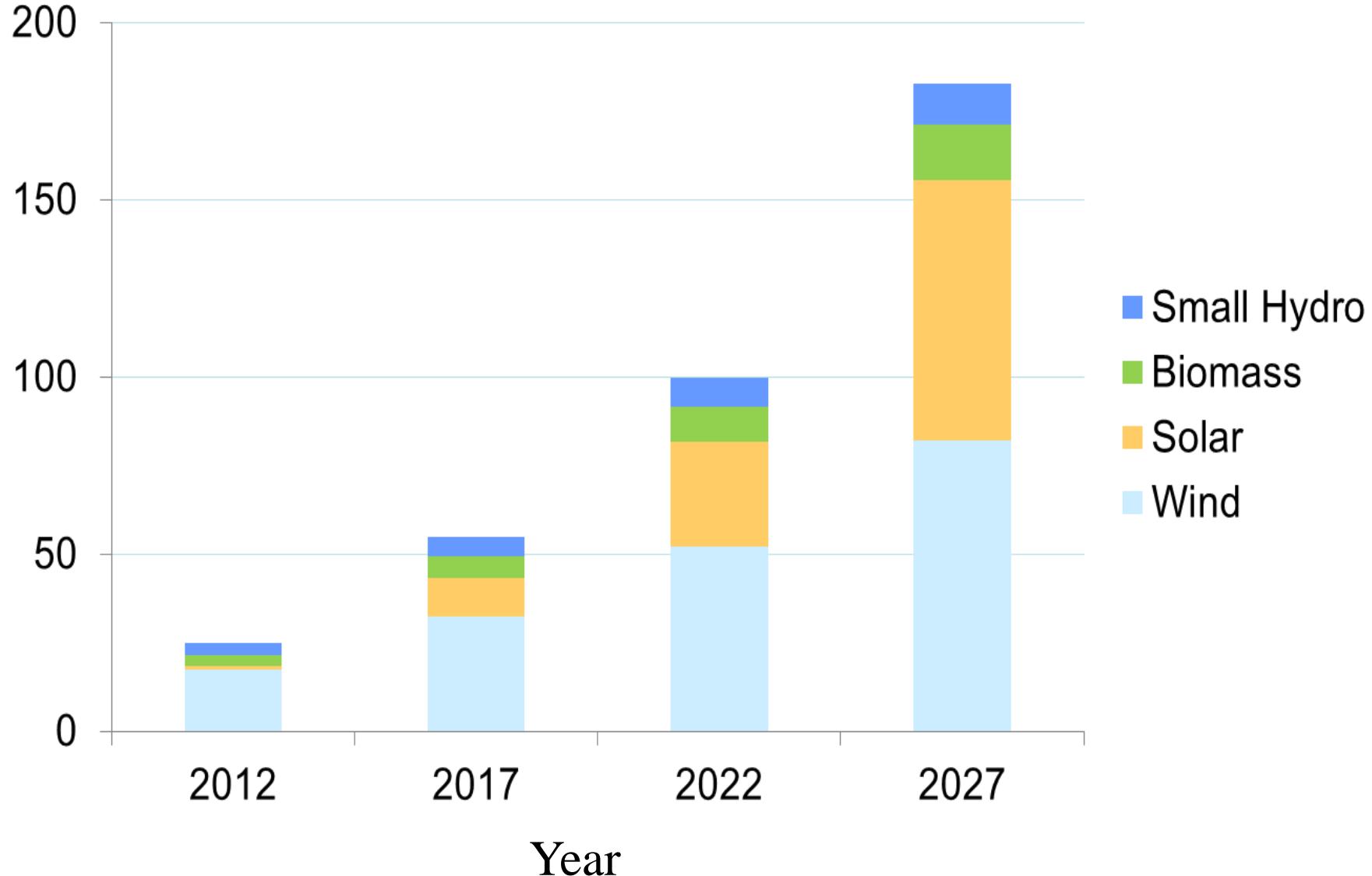


RE share in future

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



Renewable Energy Projections in GW



Thank You !

www.annauniv.edu



Lavender



Tulip