Chapter 2

Installed Capacity and Capacity Utilization

CHAPTER 2
Installed capacity and capacity utilization

Installed capacity

The world in its commitment to sustainability has pledged to expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries (SDG Target 7.B).

Development of an Energy systems which is capable of delivering to the ever growing and emerging needs of developing economies, is the need of the hour. Growing energy demands world over and in the densely populated regions of Asia including India have driven the need to shift to cleaner fuels and lager energy systems.

Thus, in India, there has been a thrust to increase installed generating capacity of power and to decrease the reliance on primary fossil fuels to cater to these needs. Generating and providing reliable power at competitive prices in a sustainable manner by optimising the use of multiple energy resource with innovative eco-friendly technologies has been at the core of policy planning in India. Also, the environmental and health burdens arising out of the use of hydrocarbons force the world towards adopting energy efficiency and clean energy systems.

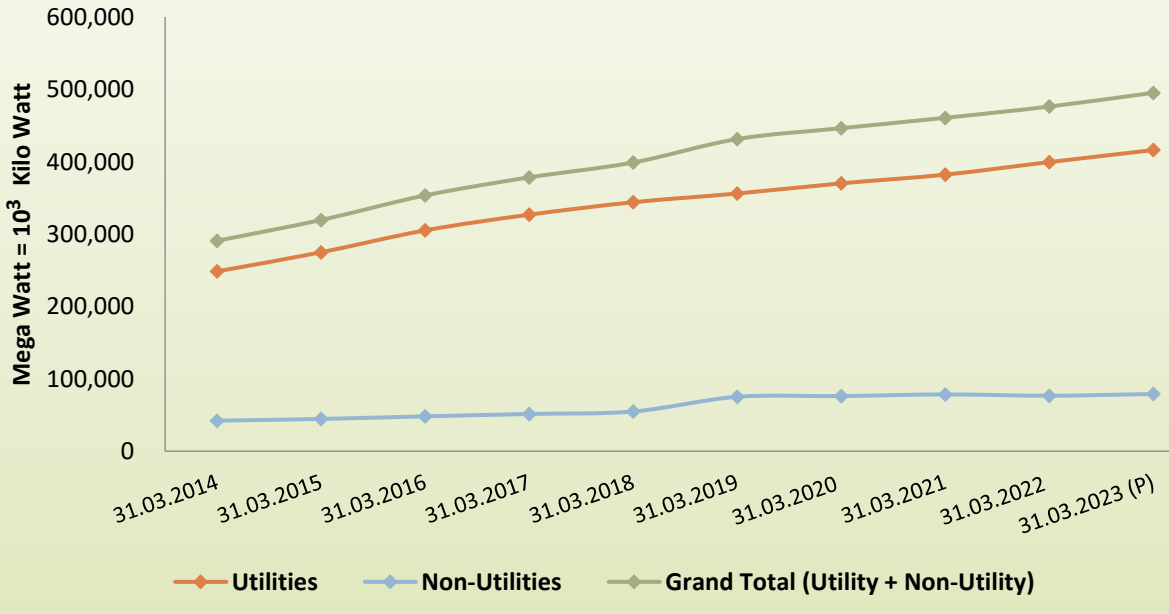
It is worthy to note here that not all potential is viable to be transformed into capacity, and overall capacity does not lead to an equal amount of generation due to production losses etc. Power plants have a capacity to produce a certain amount of power during a given time, but if they are taken offline (i.e. for maintenance or refuelling) then they are not actually generating power.

This chapter presents the capacity of coal washeries, oil refineries and electricity.

Highlights

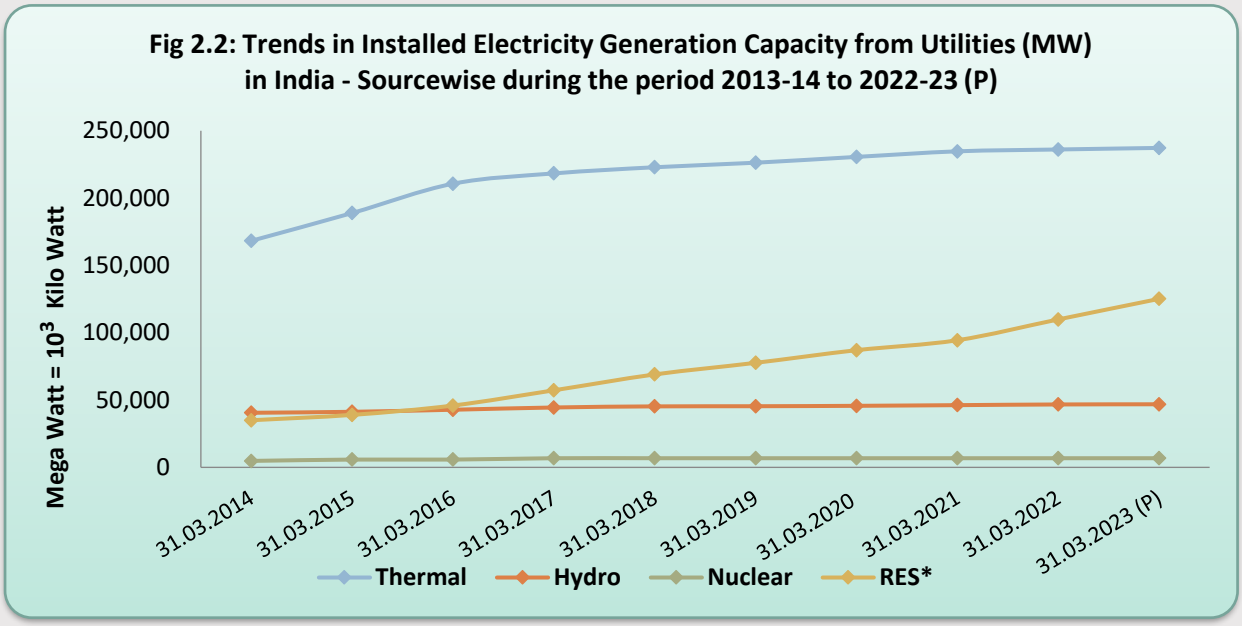
- Total installed capacity of coal washeries in India is 214.02 Million Tonne per year (MTY) as on 31.03.2022 (P) (Table 2.1).
- Similarly, as on 31.03.2023, there were a total of 23 refineries in the country, 19 in the Public Sector, 4 in the Private sector and Joint Venture (Table 2.2).
- The refining capacity of the country is 2,53,916 TMTPA on 31.03.2023 which is 2700 TMTPA more than from the last year. Public sector refineries have the dominance of over 61% of the total capacity in India.
- The Refinery production (crude throughput) achievement was 2,41,704 TMT during 2021-22 which has increased to 2,55,233 TMT during 2022-23 i.e. a net increase of 0.1% over 2021-22.
- Hence, the overall Capacity utilization of the refineries which was 96.99% during 2021-22 has increased to 101.60% in 2022-23. In the Public Sector, Indian Oil Corporation (IOC) increased its capacity utilization from 96.60% in 2021-22 to 103.37% in 2022-23. The Private and Joint venture, have also experienced negative growth rate of 2.49% during FY:2022-23 over the previous year.
- In absolute terms, the installed capacity of electricity generation increased by 3.98% to 4,95,199 MW in 2022-23 over 4,76,229 MW in 2021-22 with the major share of installed capacity existing with utilities i.e. 84.02% (Table 2.3).

Fig 2.1:Trends in Installed Electricity Generation Capacity (MW) in India during the period 2013-14 to 2022-23 (P)



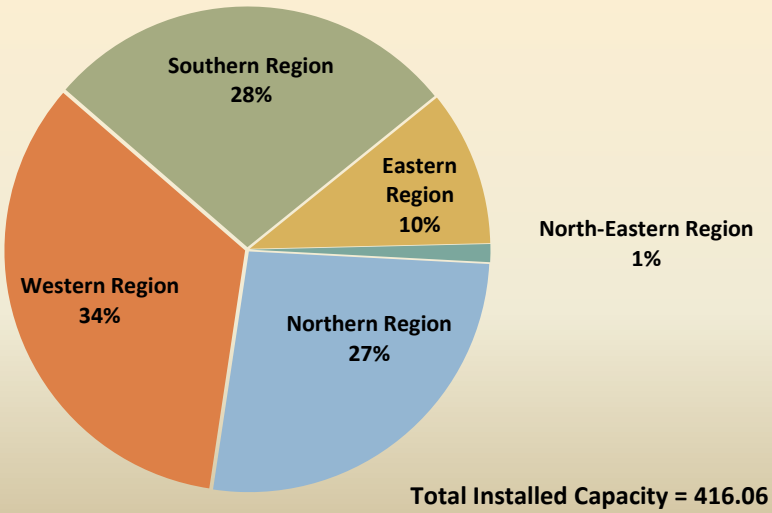
- India's Energy mix has been seeing a shift from more conventional resources of energy to renewable sources. The financial year 2022-23 has witnessed a growth of 12.20% over last year in the installed capacity of RES (Renewable Energy Sources, other than Hydro) under utility; while that of thermal sources grew only at 0.49%.

Fig 2.2: Trends in Installed Electricity Generation Capacity from Utilities (MW) in India - Sourcewise during the period 2013-14 to 2022-23 (P)



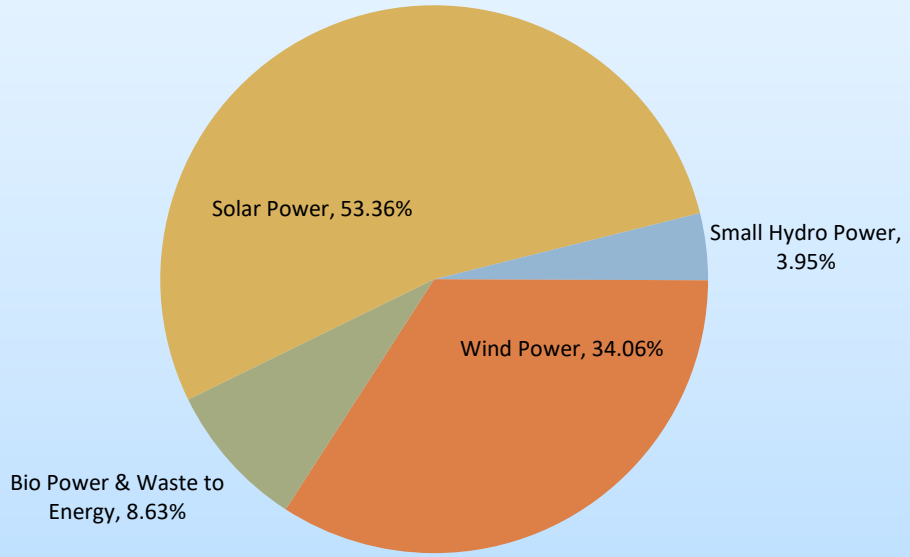
- The geographical distribution of installed capacity of electricity generating as on 31.03.2023 indicates that Western Region accounted for the highest share (34%) followed by Southern Region (28%) and Northern Region (27%). Northern Region also accounted for the highest share of hydro energy. Among states, the state of Karnataka has the highest share of hydro installed capacity of 3.63 GW and Rajasthan has the highest share of Other renewable resources of 22.05 GW. (Table 2.4).

Fig 2.3: Regionwise Installed Generation Capacity of Electricity (Utilities) as on 31.03.2023



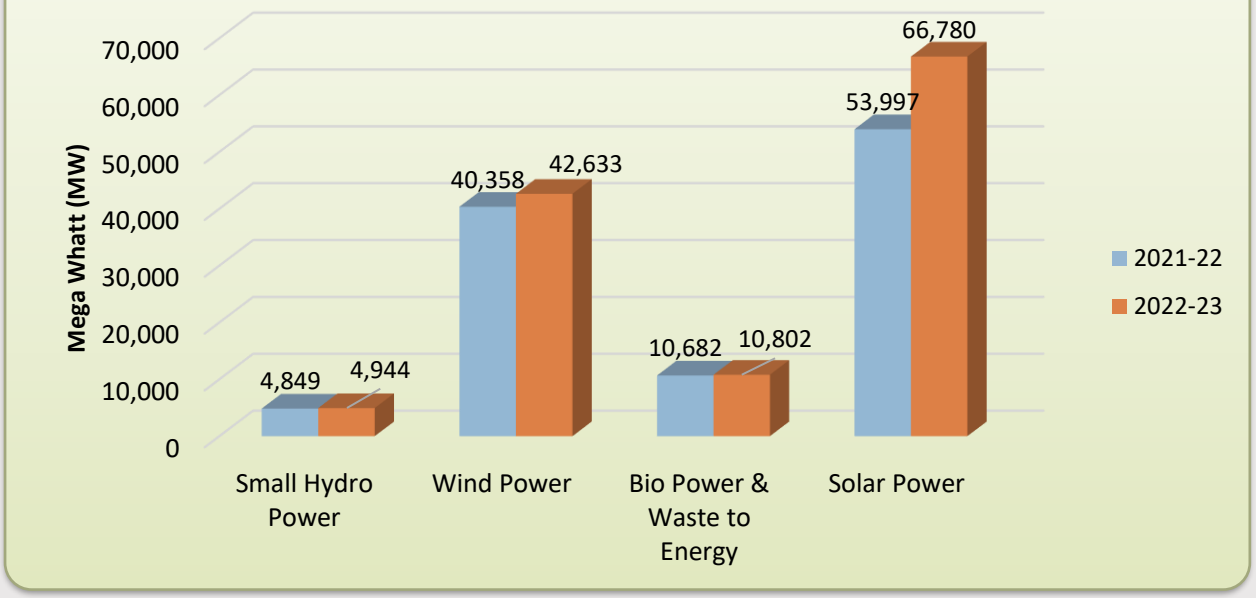
- Region wise growth in the installed capacity during 2021-22 reveals that North Region (NR) registered highest annual growth of about 5.71%. The NR has also registered a growth of over 21.95% in the RES (Renewable Energy Sources) sector. Amongst all the major states Rajasthan registered highest annual growth (18.63%) in the installed capacity.
- The total installed capacity of grid interactive renewable power, which was 1,09,885 MW in 2022 increased to 1,25,160 MW (a growth of 13.90%) during a year (2023) (Table 2.5).
- Out of the total installed generation capacity of renewable sources of power in 2023, installed capacity of Solar power including roof tops accounted for about 53.4%, followed by Wind power (34.1%) and Bio Power & Waste to Energy (8.2%). However, in terms of growth rates year on year, Solar power installed capacity has a growth rate of 23.68% from FY: 2021-22 to FY: 2022-23.
- Rajasthan had the highest installed capacity of grid connected renewable power (22,398 MW) in 2023 followed closely by Gujarat (19,436MW) mainly on account of wind and solar power.

Fig 2.4 : Sectorwise percentage distribution of Installed Grid-Interactive Renewable Power Capacity during 2022-23(P)



Total Installed Capacity = 1,25,160 MW

Fig 2.5 : Installed Capacity of Grid-Interactive Renewable Power During 2021-22 and 2022-23(P)



- Again, in case of Off-Grid/De-centralized Renewable Energy System, India has shown a steady growth over periods of time. Installation of solar Street Lightening System (SLS) has experienced a growth of 1.1% over last year. Also, the Solar Photovoltaic Plants (SPV) has registered a growth of 50.6% over last year (Figure 2.6).

Fig 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices during last 3 years

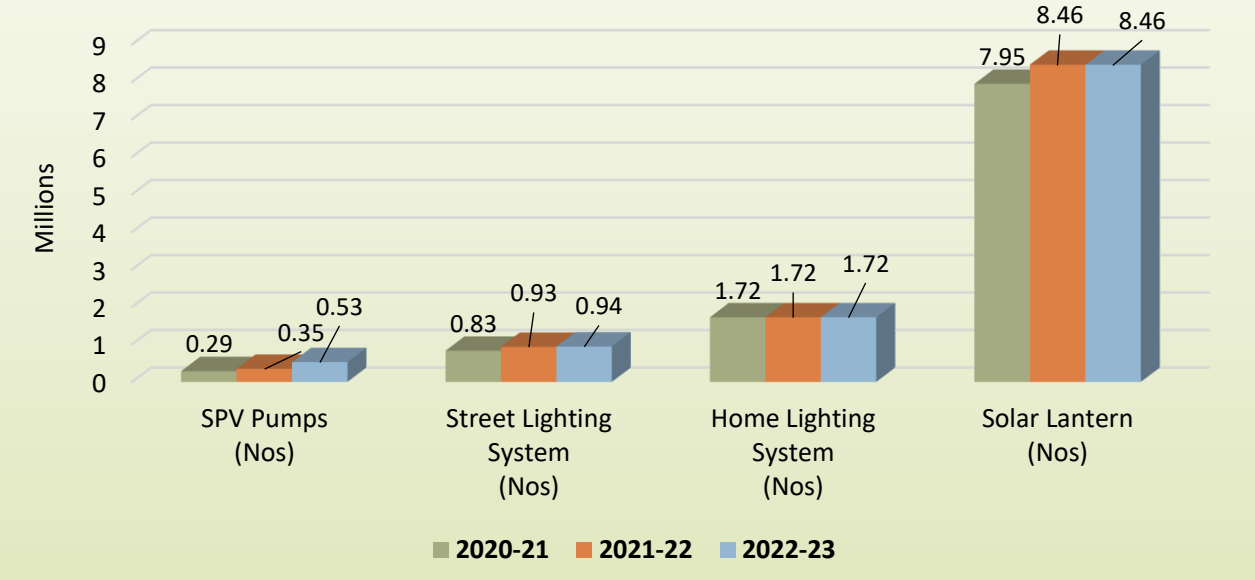


Table 2.1: Installed Capacity of Coal Washeries during 2022-23

Sl.No.	Name of Washery	Owner Company	State of Location	Raw Coal Capacity (MTPA)
1	ACB (India)Ltd, Chakabura washery	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	7.50
2	ACB (India)Ltd, Dipka washery	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	14.00
3	ACB (India)Ltd., Gevra washery	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	6.25
4	Maruti Clean Coal and Power Ltd. (MPPCL), Ratija washery	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	6.60
5	ACB (India) Ltd,Ratija washery (formerly Spectrum Coal & Power Ltd.)	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	11.00
6	ACB (India)Ltd, Binjhari washery	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	4.80
7	ACB(India) Ltd,Renki washery (formerly S.V.Power Pvt Ltd.)	Aryan Coal Benefication (India) Ltd.	Chhattisgarh	2.50
8	Chattisgarh Power & Coal Benefication Ltd.	CPCBL	Chhattisgarh	1.25
9	Hind Energy & Coal Benefication (India) Ltd, Baloda	Hind Energy & Coal Benefication (India)	Chhattisgarh	0.96
10	Hind Energy & Coal Benefication (India) Ltd., Gatora	Hind Energy & Coal Benefication (India)	Chhattisgarh	0.96
11	Hind Energy & Coal Benefication (India) Ltd., Hindadih	Hind Energy & Coal Benefication (India)	Chhattisgarh	3.60
12	Hind Energy & Coal Benefication (India) Ltd	Hind Energy & Coal Benefication (India)	Chhattisgarh	0.96
13	Clean Coal Enterprises Pvt. Ltd., Baloda	Hind Energy & Coal Benefication (India)	Chhattisgarh	0.90
14	Clean Coal Enterprises Pvt. Ltd., Gatora	Hind Energy & Coal Benefication (India)	Chhattisgarh	0.96
15	Hind Multi Services Private Limited,Gatora	Hind Energy & Coal Benefication (India)	Chhattisgarh	2.50
16	Jindal Power Ltd, Coal washery	Jindal	Chhattisgarh	4.75
17	Jindal Power Ltd, (Coal washery No.-2)	Jindal	Chhattisgarh	3.20
18	Jindal Power Ltd, (Coal washery No.-3)	Jindal	Chhattisgarh	3.60
19	Sambhavi and Coal Benefication Pvt. Ltd., Gatora	KJSL	Chhattisgarh	0.90
20	Bhatia Energy Ranjan Coal washery,Kharsia	KJSL	Chhattisgarh	0.90
21	KJSL Coal & Power Pvt. Ltd. (Dipka Gevra)	KJSL	Chhattisgarh	4.10
22	K L Energy & Coal Beneficiation Pvt. Ltd.	KJSL	Chhattisgarh	0.90
23	Mahavir Coal Washeries Pvt. Ltd., Baloda (Unit I)	Mahavir Coal Washeries Pvt. Ltd.	Chhattisgarh	0.95
24	Mahavir Coal Washeries Pvt. Ltd,Baloda. (Unit II)	Mahavir Coal Washeries Pvt. Ltd.	Chhattisgarh	0.96
25	Mahavir Coal Washeries Pvt. Ltd., Sakri Belmundi	Mahavir Coal Washeries Pvt. Ltd.	Chhattisgarh	0.95
26	Paras Power & Coal Benefication Ltd., Ghutku	Paras Power & Coal beneficiation	Chhattisgarh	0.96
27	Paras Power & Coal Benefication Ltd., Ghutku	Paras Power & Coal beneficiation	Chhattisgarh	2.50
28	Phil Coal Benefication Pvt. Ltd, Ghutku washery	Phil Coal	Chhattisgarh	2.50
29	Phil Coal Benefication Pvt. Ltd, Tenda Washery	Phil Coal	Chhattisgarh	0.90
30	Parsa East and Kanta Basan Coal washery	RRVUNL	Chhattisgarh	15.00
31	SEML-Gare Palma IV/1, Karwahi	Sarda Energy and Minerals Ltd.	Chhattisgarh	0.96
32	Dugda	Bharat Coking Coal Ltd.	Jharkhand	2.00
33	Sudamdih	Bharat Coking Coal Ltd.	Jharkhand	1.60
34	Moonidih	Bharat Coking Coal Ltd.	Jharkhand	1.60
35	Mahuda	Bharat Coking Coal Ltd.	Jharkhand	0.63
36	Madhuband	Bharat Coking Coal Ltd.	Jharkhand	2.50

Contd….

Table 2.1(Contd.): Installed Capacity of Coal Washeries during 2022-23				
Sl.No.	**Name of Washery**	**Owner Company**	**State of Location**	**Raw Coal Capacity (MTPA)**
37	Patherdih Old	Bharat Coking Coal Ltd.	Jharkhand	1.60
38	Patherdih NLW	Bharat Coking Coal Ltd.	Jharkhand	5.00
39	Dahibari	Bharat Coking Coal Ltd.	Jharkhand	1.60
40	Piparwar Washery	Central Coalfields Ltd.	Jharkhand	6.50
41	Kathara	Central Coalfields Ltd.	Jharkhand	3.00
42	Rajrappa	Central Coalfields Ltd.	Jharkhand	3.00
43	Sawang	Central Coalfields Ltd.	Jharkhand	0.75
44	Kedla	Central Coalfields Ltd.	Jharkhand	2.60
45	Monnet Daniels Coal washery Ltd.	Monnet Daniels Coal washery Ltd.	Jharkhand	3.50
46	Chasnala	Steel Authority of India Ltd.	Jharkhand	2.04
47	W.Bokaro-II	Tata Steel Ltd.	Jharkhand	2.50
48	W.Bokaro-III	Tata Steel Ltd.	Jharkhand	4.50
49	Jamadoba	Tata Steel Ltd.	Jharkhand	2.00
50	Bhelatand	Tata Steel Ltd.	Jharkhand	1.50
51	Nandan	Western Coalfield Ltd.	Madhya Pradesh	1.20
52	ACB(India) Ltd,Pandharpouni washery	Aryan Coal Benefication (India) Ltd.	Maharashtra	2.62
53	Kartikay Coal washery Pvt. Ltd,Wani washery	Aryan Coal Benefication (India) Ltd.	Maharashtra	2.50
54	Hind Maha Mineral LLP,Gondegaon washery	Hind Maha Mineral LLP	Maharashtra	2.40
55	Hind Maha Mineral LLP,Ghugus washery	Hind Maha Mineral LLP	Maharashtra	2.40
56	Hind Maha Mineral LLP,Pimpalgaon washery	Hind Maha Mineral LLP	Maharashtra	2.40
57	Rukhmai Coal Washery LLP, Nimbala Washery (Formerly M/s Bhatia Coal Washery Ltd.)	Rukhmai infrastructure pvt. Ltd.	Maharashtra	3.73
58	Indo Unique Flame Ltd,Punwat	Rukhmai infrastructure pvt. Ltd.	Maharashtra	2.40
59	Maha Mineral & Beneficiation Pvt. Ltd.	Rukhmai infrastructure pvt. Ltd.	Maharashtra	2.40
60	ALPS Mining Services (Formerly Bhatia Coal Washery)	ALPS	Odisha	2.00
61	Aryan Energy Pvt. Ltd.,Talcher	Aryan Coal Benefication (India) Ltd.	Odisha	2.34
62	ACB (india) Ltd,Talcher Unit.	Aryan Coal Benefication (India) Ltd.	Odisha	7.00
63	Aryan Ispat and Power Pvt Ltd.	Aryan Coal Benefication (India) Ltd.	Odisha	0.70
64	Hemgir	Aryan Coal Benefication (India) Ltd.	Odisha	5.00
65	Global Coal & Mining Pvt. Ltd.,Talcher Unit	GCMPL	Odisha	4.00
66	Global Coal & Mining Pvt. Ltd.,Jharsuguda Unit, IB Valley	GCMPL	Odisha	4.00
67	Utkal Energy Ltd.	Utkal	Odisha	1.08
68	Manuguru Washery, SCCL (Through Global Coal & Mining Pvt. Ltd. Manuguru)	Singareni Collieries Company Ltd.	Telangana	0.96
69	Bina Deshaling Plant	Northen Coalfield Ltd.	Uttar Pradesh	4.50
70	Bhojudih	Bharat Coking Coal Ltd.	West Bengal	1.70
71	Sarshatali Coal Washery	CESC Ltd.	West Bengal	1.50
Total				**214.02**
Source: Ministry of Coal				

Table 2.2: Installed Capacity and Utilization of Refineries of Crude Oil

Sl. No.	Refinery	Refinery Capacity (TMTPA)			Crude Oil Processed (TMT)		Capacity Utilisation (%)		
		31.03.2021	31.03.2022	31.03.2023	2021-22	2022-23(P)	2021-22	2022-23(P)	Change in Utilisation
1	2	3	4	5	6	7	8	9	10
(a)	**PUBLIC SECTOR**	**1,49,716**	**1,51,716**	**1,54,416**	**1,45,491**	**1,61,500**	**97.18**	**106.45**	**9.27**
	IOCL, Guwahati, Assam	1,000	1,000	1,000	730	1,080	**73.02**	**107.97**	**34.95**
	IOCL, Barauni, Bihar	6,000	6,000	6,000	5,620	6,785	**93.66**	**113.09**	**19.43**
	IOCL, Koyali, Gujarat	13,700	13,700	13,700	13,474	15,567	**98.35**	**113.63**	**15.28**
	IOCL, Haldia, West Bengal	8,000	8,000	8,000	7,305	8,506	**91.32**	**106.33**	**15.01**
	IOCL, Mathura, Uttar Pradesh	8,000	8,000	8,000	9,123	9,573	**114.04**	**119.66**	**5.63**
	IOCL, Digboi, Assam	650	650	650	708	713	**108.90**	**109.68**	**0.78**
	IOCL, Panipat, Haryana	15,000	15,000	15,000	14,849	13,810	**98.99**	**92.07**	**-6.92**
	IOCL, Bongaigaon, Assam	2,700	2,700	2,700	2,639	2,775	**97.72**	**102.78**	**5.06**
	IOCL, Paradip, Odisha	15,000	15,000	15,000	13,217	13,599	**88.12**	**90.66**	**2.54**
	Total IOC	**70,050**	**70,050**	**70,050**	**67,665**	**72,408**	**96.60**	**103.37**	**6.77**
	BPCL, Mumbai, Maharashtra	12,000	12,000	12,000	14,437	14,546	**120.30**	**121.22**	**0.91**
	BPCL, Kochi, Kerala	15,500	15,500	15,500	15,402	16,017	**99.36**	**103.33**	**3.97**
	BPCL, Bina, Madhya Pradesh	7,800	7,800	7,800	7,410	7,841	**95.00**	**100.52**	**5.52**
	Total BPCL	**35,300**	**35,300**	**35,300**	**37,248**	**38,404**	**105.52**	**108.79**	**3.27**
	HPCL, Mumbai, Maharashtra	7,500	9,500	9,500	5,558	9,804	**74.10**	**103.20**	**29.10**
	HPCL, Visakh, Andhra Pradesh	8,300	8,300	11,000	8,410	9,287	**101.32**	**111.89**	**10.56**
	Total HPCL	**15,800**	**17,800**	**20,500**	**13,968**	**19,091**	**88.40**	**107.25**	**18.85**
	CPCL, Manali, Tamil Nadu	10,500	10,500	10,500	9,040	11,316	**86.10**	**107.77**	**21.67**
	CPCL, Narimanam, Tamil Nadu	-	-	-	-	-	-	-	-
	Total CPCL	**10,500**	**10,500**	**10,500**	**9,040**	**11,316**	**86.10**	**107.77**	**21.67**
	NRL, Numaligarh, Assam	3,000	3,000	3,000	2,624	3,091	**87.48**	**103.05**	**15.57**
	MRPL, Mangalore, Karnataka	15,000	15,000	15,000	14,871	17,116	**99.14**	**114.11**	**14.97**
	ONGC, Tatipaka, Andhra Pradesh	66	66	66	75	74	**113.84**	**111.40**	**-2.44**
(b)	**PRIVATE SECTOR & JVs SECTOR**	**99,500**	**99,500**	**99,500**	**96,213**	**93,733**	**96.70**	**94.20**	**-2.49**
	RIL, Jamnagar, Gujarat	33,000	33,000	33,000	34,757	34,433	**105.32**	**104.34**	**-0.98**
	RIL, SEZ-Jamnagar, Gujarat	35,200	35,200	35,200	28,264	27,872	**80.30**	**79.18**	**-1.12**
	Nyara Energy Ltd. Vadinar	20,000	20,000	20,000	20,164	18,692	**100.82**	**93.46**	**-7.36**
	HMEL, GGS, Bathinda, Punjab	11,300	11,300	11,300	13,027	12,735	**115.28**	**112.70**	**-2.58**
	Total (a+b)	**2,49,216**	**2,51,216**	**2,53,916**	**2,41,704**	**2,55,233**	**96.99**	**101.60**	**4.61**

1.Total may not tally due to rounding off. (P): Provisional

2. Crude throughput in terms of crude oil processed.

3. Capacity utilisation is equal to crude oil processed in current year divided by refining capacity at the end of previous year*100.

Source: M/o Petroleum & Natural Gas

Table 2.3 (A): Year wise Installed Capacity of Electricity Generation in Utilities and Non-utilities

(in Mega Watt = 10^3 Kilo Watt)

As on	Utilities							
	Thermal				Hydro	Nuclear	RES*	Total
	Steam	Diesel	Gas	Total				
1	2	3	4	5	6	7	8	9
31.03.2014	1,45,273	1,200	21,782	1,68,255	40,531	4,780	34,988	2,48,554
31.03.2015	1,64,636	1,200	23,062	1,88,898	41,267	5,780	38,959	2,74,904
31.03.2016	1,85,173	994	24,509	2,10,675	42,783	5,780	45,924	3,05,162
31.03.2017	1,92,163	838	25,329	2,18,330	44,478	6,780	57,244	3,26,833
31.03.2018	1,97,172	838	24,897	2,22,907	45,293	6,780	69,022	3,44,002
31.03.2019	2,00,705	638	24,937	2,26,279	45,399	6,780	77,642	3,56,100
31.03.2020	2,05,135	510	24,955	2,30,600	45,699	6,780	87,028	3,70,106
31.03.2021	2,09,295	510	24,924	2,34,728	46,209	6,780	94,434	3,82,151
31.03.2022	2,10,700	510	24,900	2,36,109	46,723	6,780	1,09,885	3,99,497
31.03.2023 (P)	2,11,856	589	24,824	2,37,269	46,850	6,780	1,25,160	4,16,059
Growth rate of 2022-23 over 2021-22(%)	**0.55**	**15.56**	**-0.30**	**0.49**	**0.27**	**0.00**	**13.90**	**4.15**
CAGR 2013-14 to 2022-23(%)	**4.28**	**-7.60**	**1.46**	**3.89**	**1.62**	**3.96**	**15.21**	**5.89**

* RES= Renewable Energy Sources excluding Hydro

(P): Provisional

Capacity in respect of Self Generating Industries includes units of capacity 1 MW and above.
CAGR: Compound Annual Growth Rate = ((Current Value/Base Value) ^ (1/nos. of years)-1) *100

Source: Central Electricity Authority.

Table 2.3 (B): Year wise Installed Capacity of Electricity Generation in Utilities and Non-utilities

(in Mega Watt = 10^3 x Kilo Watt)

As on	Non-Utilities							Grand Total (Utility + Non-Utility)
	Thermal				Hydro	RES*	Total	
	Steam	Diesel	Gas	Total				
	10	11	12	13	14	15	16	17= 9+16
31.03.2014	24,752	11,432	4,751	40,935	64	1,259	42,258	2,90,812
31.03.2015	26,089	12,009	5,193	43,291	65	1,301	44,657	3,19,561
31.03.2016	28,688	12,347	5,819	46,853	59	1,368	48,279	3,53,442
31.03.2017	30,572	13,350	6,109	50,031	65	1,433	51,529	3,78,362
31.03.2018	32,854	13,145	7,156	53,155	51	1,726	54,933	3,98,935
31.03.2019	47,679	15,571	8,787	72,037	103	3,067	75,207	4,31,307
31.03.2020	51,543	12,775	7,316	71,633	131	4,475	76,239	4,46,346
31.03.2021	47,760	17,563	7,361	72,683	131	5,694	78,508	4,60,659
31.03.2022	45,303	18,649	5,685	69,637	135	6,961	76,732	4,76,229
31.03.2023 (P)	47,000	19,200	5,700	71,900	140	7,100	79,140	4,95,199
Growth rate of 2022-23 over 2021-22(%)	**3.75**	**2.96**	**0.26**	**3.25**	**4.01**	**2.00**	**3.14**	**3.98**
CAGR 2013-14 to 2022-23(%)	**7.39**	**5.93**	**2.04**	**6.46**	**9.16**	**21.19**	**7.22**	**6.09**

* RES= Renewable Energy Sources excluding Hydro

(P): Provisional

Capacity in respect of Self Generating Industries includes units of capacity 1 MW and above.
CAGR: Compound Annual Growth Rate = ((Current Value/Base Value) ^ (1/nos. of years)-1)) *100

Source: Central Electricity Authority.

Table 2.4 : Regionwise and Statewise Installed Capacity of Electricity Generation (Utilities)

(in GW)

States/UTs	Hydro		Thermal		Nuclear		RES*		Total		Growth Rate (2021-22 to 2022-23) (%)
	31.03.2022	31.03.2023	31.03.2022	31.03.2023	31.03.2022	31.03.2023	31.03.2022	31.03.2023	31.03.2022	31.03.2023	
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.06	**6.38**
Delhi	0.00	0.00	2.36	2.36	0.00	0.00	0.27	0.30	2.63	2.66	**1.22**
Haryana	0.20	0.20	4.82	4.82	0.00	0.00	1.24	1.36	6.26	6.38	**1.92**
Himachal Pradesh	2.91	2.91	0.00	0.00	0.00	0.00	1.04	1.07	3.96	3.98	**0.68**
Jammu & Kashmir	1.23	1.23	0.18	0.18	0.00	0.00	0.24	0.24	1.64	1.65	**0.36**
Punjab	1.24	1.24	6.92	6.92	0.00	0.00	1.77	1.87	9.94	10.03	**0.98**
Rajasthan	0.43	0.43	11.63	11.63	0.00	0.00	16.70	22.05	28.76	34.12	**18.63**
Uttar Pradesh	0.72	0.72	13.43	13.34	0.00	0.00	4.45	4.75	18.61	18.82	**1.09**
Uttarakhand	2.08	2.20	0.55	0.55	0.00	0.00	0.93	0.93	3.56	3.68	**3.42**
Central Sector NR	11.53	11.53	15.54	15.54	1.62	1.62	0.38	0.38	29.08	29.08	**0.00**
Sub-Total (NR)	**20.36**	**20.48**	**55.44**	**55.34**	**1.62**	**1.62**	**27.07**	**33.01**	**104.49**	**110.46**	**5.71**
Chhattisgarh	0.12	0.12	16.01	16.01	0.00	0.00	0.87	1.30	17.00	17.43	**2.53**
Gujarat	0.77	0.77	20.23	20.23	0.00	0.00	16.34	19.19	37.35	40.19	**7.63**
Madhya Pradesh	1.70	1.70	11.80	11.80	0.00	0.00	5.17	5.61	18.67	19.10	**2.34**
Maharashtra	3.33	3.33	22.26	22.26	0.00	0.00	10.53	12.63	36.12	38.22	**5.81**
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04	**0.71**
D. & N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	**0.00**
Goa	0.00	0.00	0.05	0.05	0.00	0.00	0.02	0.03	0.07	0.07	**9.57**
Central Sector WR	1.52	1.52	22.28	22.28	1.84	1.84	0.67	0.67	26.31	26.31	**0.00**
Sub-Total (WR)	**7.45**	**7.45**	**92.62**	**92.62**	**1.84**	**1.84**	**33.65**	**39.47**	**135.55**	**141.38**	**4.30**
Andhra Pradesh	1.67	1.67	12.30	13.10	0.00	0.00	8.96	9.11	22.94	23.89	**4.14**
Telangana	2.48	2.48	7.46	7.46	0.00	0.00	4.95	5.10	14.89	15.04	**0.98**
Karnataka	3.63	3.63	7.11	7.11	0.00	0.00	15.90	16.72	26.64	27.46	**3.06**
Kerala	1.86	1.86	0.33	0.33	0.00	0.00	0.62	1.04	2.81	3.24	**15.29**
Tamil Nadu	2.18	2.18	9.03	9.03	0.00	0.00	15.92	17.74	27.13	28.95	**6.71**
Puducherry	0.00	0.00	0.03	0.03	0.00	0.00	0.01	0.04	0.05	0.07	**47.28**
Lakshadweep	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03	**820.49**
Central Sector SR #	0.00	0.00	13.25	13.25	3.32	3.32	0.54	0.54	17.11	17.11	**0.00**
Sub-Total (SR)	**11.82**	**11.83**	**49.52**	**50.35**	**3.32**	**3.32**	**46.91**	**50.29**	**111.57**	**115.78**	**3.77**
Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.39	0.39	**0.58**
Jharkhand	0.13	0.13	2.25	2.25	0.00	0.00	0.10	0.11	2.48	2.49	**0.69**
Odisha	2.07	2.07	4.94	4.94	0.00	0.00	0.61	0.62	7.62	7.63	**0.14**
West Bengal	0.99	0.99	6.95	6.93	0.00	0.00	0.59	0.62	8.52	8.53	**0.17**
Sikkim	0.87	0.87	0.00	0.00	0.00	0.00	0.06	0.06	0.93	0.93	**0.32**
A. & N. Islands	0.00	0.00	0.04	0.09	0.00	0.00	0.03	0.03	0.07	0.12	**76.18**
Central Sector ER $	1.01	1.01	21.85	22.30	0.00	0.00	0.02	0.02	22.87	23.32	**1.97**
Sub-Total (ER)	**5.07**	**5.07**	**36.03**	**36.51**	**0.00**	**0.00**	**1.78**	**1.85**	**42.87**	**43.43**	**1.29**
Arunachal Pradesh	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.14	**1.69**
Assam	0.10	0.10	0.33	0.31	0.00	0.00	0.13	0.16	0.56	0.57	**1.25**
Manipur	0.00	0.00	0.04	0.04	0.00	0.00	0.02	0.02	0.05	0.05	**0.06**
Meghalaya	0.32	0.32	0.00	0.00	0.00	0.00	0.05	0.05	0.37	0.37	**0.00**
Mizoram	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.04	0.07	**65.63**
Nagaland	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.03	0.04	**5.93**
Tripura	0.00	0.00	0.14	0.11	0.00	0.00	0.03	0.03	0.16	0.13	**-17.98**
Central Sector NER	1.61	1.61	2.00	2.00	0.00	0.00	0.03	0.03	3.64	3.64	**0.00**
Sub-Total (NER)	**2.03**	**2.03**	**2.51**	**2.45**	**0.00**	**0.00**	**0.47**	**0.54**	**5.01**	**5.02**	**0.22**
Total States	**31.06**	**31.19**	**161.18**	**161.89**	**0.00**	**0.00**	**108.25**	**123.53**	**300.49**	**316.60**	**5.36**
Total Central	**15.66**	**15.66**	**74.93**	**75.38**	**6.78**	**6.78**	**1.63**	**1.63**	**99.00**	**99.45**	**0.45**
Total All India	**46.72**	**46.85**	**236.11**	**237.27**	**6.78**	**6.78**	**109.89**	**125.16**	**399.50**	**416.06**	**4.15**

$ Damodar Valley Corporation (DVC) installed capacity is considered under central sector(ER)

* RES: Renewable Energy Sources excluding hydro

Includes NLC-Central capacity also

Sub-totals/Totals may not tally due to conversion to GW and rounding off.

Source : Central Electricity Authority.

Table 2.5: State-wise cumulative Installed Capacity of Renewable Power as on 31st March

S. No.	STATES / UTs	Small Hydro Power (MW)		Wind Power (MW)		Bio-Power-BM Power/Cogen (MW)		Waste to Energy (MW)		Solar Power (MW)		Total Capacity (MW)		Growth Rate(2021-22 to 2022-23)
		2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	
1	Andhra Pradesh	162.11	163.31	4096.65	4096.65	483.67	483.67	82.37	82.36	4386.76	4534.19	**9212**	**9360**	**1.61**
2	Arunachal Pradesh	131.11	133.11			0.00	0.00	0.00	0.00	11.23	11.64	**142**	**145**	**1.70**
3	Assam	34.11	34.11			2.00	2.00	0.00	0.00	117.94	147.93	**154**	**184**	**19.47**
4	Bihar	70.70	70.70			124.70	124.70	1.32	1.32	190.63	192.88	**387**	**390**	**0.58**
5	Chhatisgarh	76.00	76.00			274.59	274.59	0.41	0.41	518.08	948.82	**869**	**1300**	**49.56**
6	Goa	0.05	0.05			0.00	0.00	0.34	0.34	19.95	26.49	**20**	**27**	**32.15**
7	Gujarat	89.39	91.64	9209.22	9978.92	77.30	77.30	31.96	33.43	7180.03	9254.56	**16588**	**19436**	**17.17**
8	Haryana	73.50	73.50			240.66	240.66	17.34	18.77	910.63	1029.16	**1242**	**1362**	**9.66**
9	Himachal Pradesh	954.11	969.71			9.20	9.20	1.00	1.00	76.16	87.49	**1040**	**1067**	**2.59**
10	Jammu & Kashmir	184.32	146.68			0.00	0.00	0.00	0.00	54.73	49.44	**239**	**196**	**-17.96**
11	Jharkhand	4.05	4.05			4.30	4.30	0.00	0.00	88.79	105.84	**97**	**114**	**17.55**
12	Karnataka	1280.73	1280.73	5130.90	5294.95	1887.30	1887.30	14.85	14.85	7590.81	8241.40	**15905**	**16719**	**5.12**
13	Kerala	242.52	266.52	62.50	62.50	2.27	2.27	0.23	0.23	363.18	761.43	**671**	**1093**	**62.96**
14	Ladakh		40.99				0.00		0.00		7.80	**-**	**49**	**-**
15	Madhya Pradesh	99.71	123.71	2519.89	2844.29	107.35	107.35	23.98	27.59	2717.95	2802.14	**5469**	**5905**	**7.98**
16	Maharashtra	381.08	381.08	5012.83	5012.83	2584.40	2584.40	47.75	56.29	2631.02	4722.90	**10657**	**12758**	**19.71**
17	Manipur	5.45	5.45			0.00	0.00	0.00	0.00	12.25	12.28	**18**	**18**	**0.17**
18	Meghalaya	32.53	32.53			13.80	13.80	0.00	0.00	4.15	4.15	**50**	**50**	**0.00**
19	Mizoram	36.47	45.47			0.00	0.00	0.00	0.00	7.90	28.02	**44**	**73**	**65.63**
20	Nagaland	30.67	32.67			0.00	0.00	0.00	0.00	3.04	3.04	**34**	**36**	**5.93**
21	Odisha	106.63	115.63			59.22	59.22	0.00	0.00	451.24	453.17	**617**	**628**	**1.77**
22	Punjab	176.10	176.10			473.45	496.15	18.20	26.12	1100.07	1167.26	**1768**	**1866**	**5.53**
23	Rajasthan	23.85	23.85	4326.82	5193.42	121.25	121.25	3.83	3.83	12564.87	17055.70	**17041**	**22398**	**31.44**
24	Sikkim	52.11	55.11			0.00	0.00	0.00	0.00	4.68	4.69	**57**	**60**	**5.30**
25	Tamil Nadu	123.05	123.05	9866.37	10017.17	1012.65	1012.65	30.05	31.05	5067.18	6736.43	**16099**	**17920**	**11.31**
26	Telangana	90.87	90.87	128.10	128.10	160.10	160.10	59.64	60.27	4520.48	4666.03	**4959**	**5105**	**2.95**
27	Tripura	16.01	16.01			0.00	0.00	0.00	0.00	14.89	17.60	**31**	**34**	**8.77**
28	Uttar Pradesh	49.10	49.10			2117.26	2118.26	72.73	98.47	2244.43	2515.22	**4484**	**4781**	**6.64**
29	Uttarakhand	218.82	218.82			130.22	130.22	9.22	9.22	573.54	575.53	**932**	**934**	**0.21**
30	West Bengal	98.50	98.50			319.92	338.62	2.53	4.48	166.00	179.97	**587**	**622**	**5.90**
31	Andaman & Nicobar	5.25	5.25			0.00	0.00	0.00	0.00	29.49	29.91	**35**	**35**	**1.21**
32	Chandigarh					0.00	0.00	0.00	0.00	55.17	58.69	**55**	**59**	**6.38**
32	Dadar & Nagar Haveli					0.00	0.00	0.00	0.00	5.46	5.46	**5**	**5**	**0.00**
34	Daman & Diu					0.00	0.00	0.00	0.00	40.72	41.01	**41**	**41**	**0.71**
35	Delhi					0.00	0.00	59.00	84.00	211.12	218.26	**270**	**302**	**11.90**
36	Lakshwadeep					0.00	0.00	0.00	0.00	3.27	3.27	**3**	**3**	**0.00**
37	Puducherry					0.00	0.00	0.00	0.00	13.69	35.53	**14**	**36**	**159.53**
38	Others			4.30	4.30	0.00	0.00	0.00	0.00	45.01	45.01	**49**	**49**	**0.00**
Total (MW)		**4849**	**4944**	**40358**	**42633**	**10206**	**10248**	**477**	**554**	**53997**	**66780**	**109885**	**125160**	**13.90**
% Distribution		**4.4**	**4.0**	**36.7**	**34.1**	**9.3**	**8.2**	**0.4**	**0.4**	**49.1**	**53.4**	**100**	**100**	

Source: Ministry of New and Renewable Energy

Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2023

Sl. No.	State/UT	Biogas Plants (Nos)	SPV Pumps (Nos.)	Solar Photovoltaic (SPV) Systems				Waste to Energy (MW)
				SLS (Nos.)	HLS (Nos.)	SL (Nos.)	PP (KWP)	
1	2	3	4	5	6	7	8	10
1	Andhra Pradesh	268628	34,045	16,460	22,972	77,803	3,816	29.20
2	Arunachal Pradesh	3621	148	25,008	35,065	2,18,551	963	
3	Assam	139414	45	29,538	46,879	6,47,761	1,605	
4	Bihar	130081	2,813	54,147	12,303	17,35,227	6,905	1.32
5	Chhattisgarh	60368	1,19,282	4,538	42,232	3,311	31,373	0.41
6	Goa	4245	45	707	393	1,093	33	
7	Gujarat	435862	13,981	5,004	9,253	31,603	13,577	25.93
8	Haryana	64056	46,260	34,625	56,727	93,853	4,571	7.57
9	Himachal Pradesh	47718	507	98,800	22,592	33,909	21,606	1.00
10	Jammu & Kashmir	3201	568	39,076	1,44,316	51,224	8,130	
11	Jharkhand	7890	17,231	14,344	9,450	7,90,515	3,770	
12	Karnataka	515243	7,734	5,694	52,638	7,781	7,854	13.85
13	Kerala	154349	900	1,735	41,912	54,367	16,268	0.23
14	Ladakh	0	-	-	-	-	-	
15	Madhya Pradesh	381237	25,138	16,808	7,920	5,29,101	7,654	12.19
16	Maharashtra	935480	50,623	10,420	3,497	2,39,297	3,858	43.70
17	Manipur	2128	68	32,767	24,583	69,722	1,581	
18	Meghalaya	11156	54	5,800	14,874	97,360	2,004	
19	Mizoram	5857	37	20,325	12,060	1,55,217	3,895	
20	Nagaland	7953	3	16,045.0	1,045.0	30,766.0	1,506.0	
21	Odisha	271848	10,856	19,109.0	5,274.0	99,843.0	2,321.5	
22	Punjab	187980	17,446	43,758	8,626	17,495	2,066	15.37
23	Rajasthan	72906	1,13,841	8,934.0	1,87,968.0	2,25,851.0	1,04,449.0	3.83
24	Sikkim	9044	-	504	15,059	45,200	850	
25	Tamil Nadu	224083	8,503	41,419	2,98,641	16,818	13,053	24.65
26	Telangana	316727	424	2,458	-	1,42,000	7,450	14.47
27	Tripura	3744	1,846	15,517	32,723	3,64,012	867	
28	Uttar Pradesh	441306	48,695	3,02,532	2,35,909	23,51,205	10,638	98.47
29	Uttarakhand	365352	344	43,803	91,595	1,65,071	4,060	9.22
30	West Bengal	1216	673	18,203	1,45,332	17,662	1,730	4.48
31	Andaman & Nicobar	97	5	1,490	468	6,296	167	
32	Chandigarh	169	12	901	275	1,675	730	
33	Dadar & Nagar Haveli	681	-	-	-	-	-	
34	Daman & Diu	0	-	-	-	-	-	
35	Delhi	578	90	301	-	4,807	1,269	
36	Lakshadweep	0	-	4,465	600	5,289	2,190	
37	Puducherry	17541	21	417	25	1,637	121	
38	Others*		4,621	9,150	1,40,273	1,25,797	23,885	
	Total	**50,91,759**	**5,26,859**	**9,44,802**	**17,23,479**	**84,59,119**	**3,16,813**	**306**

* Others includes installations through NGOs/IREDA in different states

SLS = Street Lighting System; HLS = Home Lighting System; SL = Solar Lantern; PP = Power Plants; SPV = Solar Photovoltaic;

MW = Mega Watt; KWP = Kilowatt peak

Source : Ministry of New and Renewable Energy