

|| 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 larger 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.

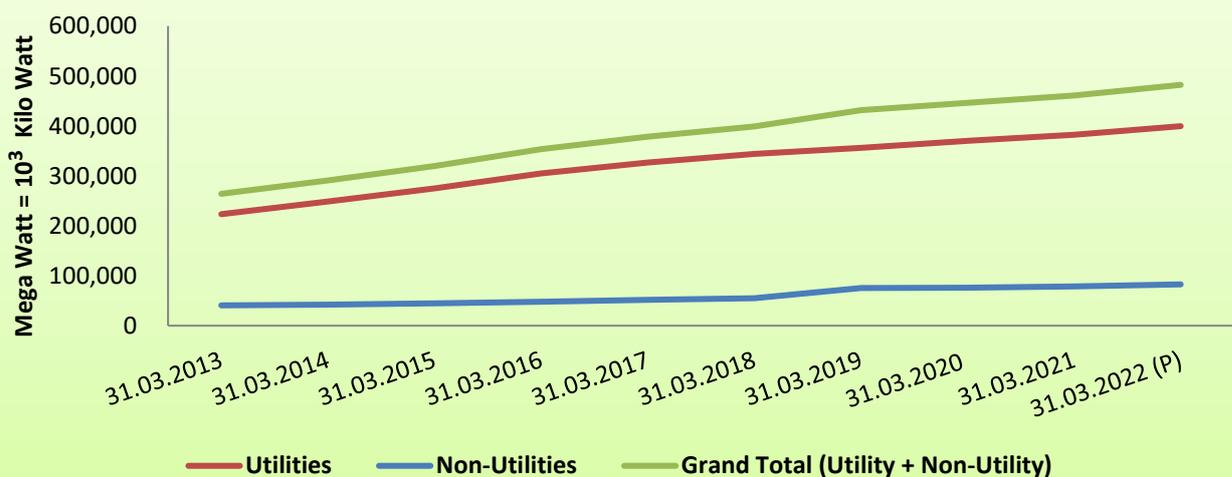
It is worthy to note here that not all potential is viable to be transformed into capacity, and overall capacity does not lead to an equal amount of generation due to production losses etc. Power plants have a capacity to produce a certain amount of power during a given time, but if they are taken offline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

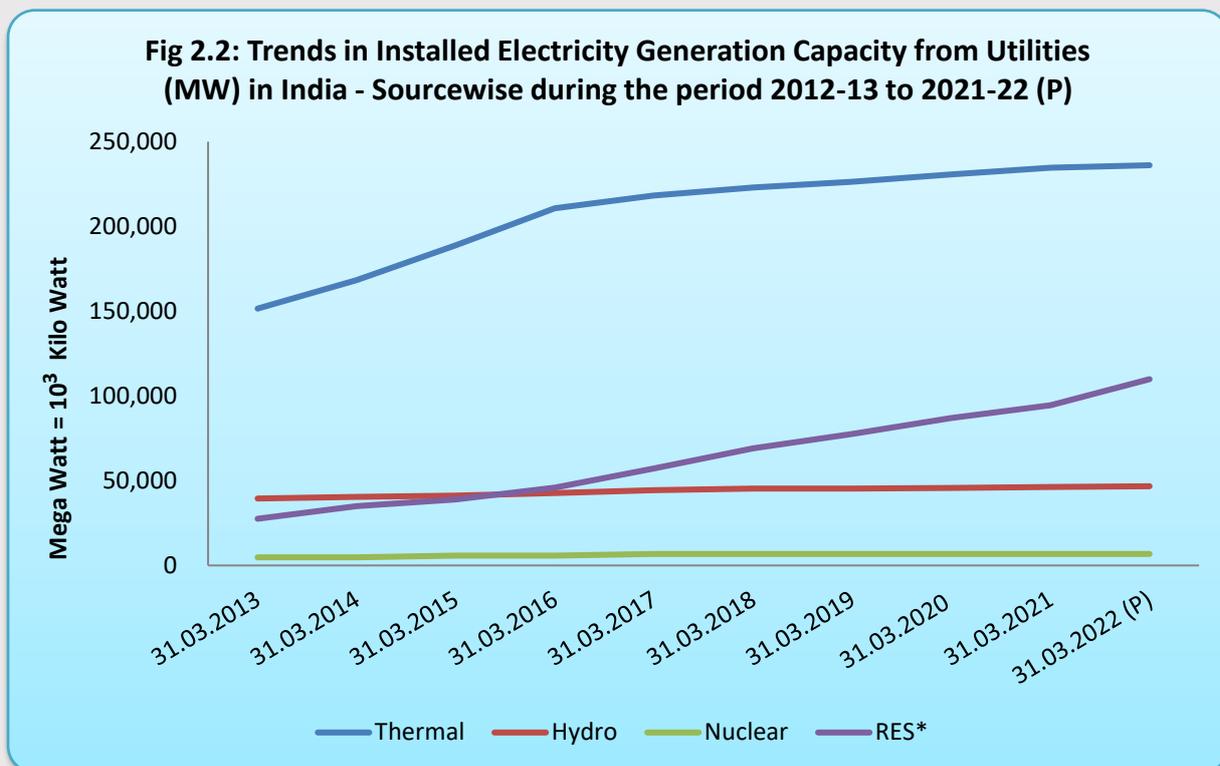
Highlights

- Total installed capacity of coal washeries in India is 152.31 Million Tonne per year (MTY) as on 31.03.2022 (P). This comprises of 37.18 MTY in coking and 115.13 MTY in Non-Coking Coal Washeries (Table 2.1).
- Similarly, as on 31.03.2022, 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 2,51,216 TMTPA on 31.03.2021 which is 2000 TMTPA more than from the last year. Public sector refineries have the dominance of over 60% of the total capacity in India.
- The Refinery production (crude throughput) achievement was 2,21,773 TMT during 2020-21 which has increased to 2,41,703 TMT during 2021-22 i.e. a net increase of 9% over 2020-21.
- Hence, the overall Capacity utilization of the refineries which was 88.76% during 2020-21 has increased to 96.99% in 2021-22. In the Public Sector, Indian Oil Corporation (IOC) increased its capacity utilization from 89.46% in 2020-21 to 96.60% in 2021-22. The Private and Joint venture, have also experienced positive growth rate of 8.17% during FY:2021-22 over the previous year.
- In absolute terms, the installed capacity of electricity generation increased by 4.68% to 4,82,232 MW in 2021-22 over 4,60,659 MW in 2020-21 with the major share of installed capacity existing with utilities i.e. 82.84% (Table 2.3).

Fig 2.1:Trends in Installed Electricity Generation Capacity (MW) in India during the period 2012-13 to 2021-22 (P)

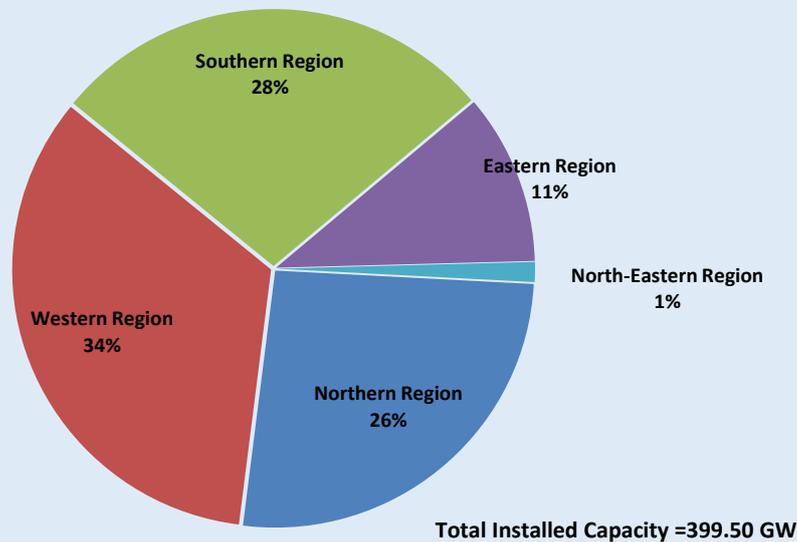


- India's Energy mix has been seeing a shift from more conventional resources of energy to renewable sources. The financial year 2021-22 has witnessed a growth of 16.4% over last year in the installed capacity of RES (Renewable Energy Sources, other than Hydro) under utility; while that of thermal sources grew only at 0.06%.



- The geographical distribution of installed capacity of electricity generating as on 31.03.2022 indicates that Western Region accounted for the highest share (34%) followed by Southern Region (28%) and Northern Region (26%). 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 16.70 GW. (Table 2.4).

Fig 2.3: Regionwise Installed Generation Capacity of Electricity (Utilities) as on 31.03.2022



- Region wise growth in the installed capacity during 2021-22 reveals that North Region (NR) registered highest annual growth of about 10.75%. The NR has also registered a growth of over 45% in the RES (Renewable Energy Sources) sector. Amongst all the major states Rajasthan registered highest annual growth (35.25%) in the installed capacity.
- The total installed capacity of grid interactive renewable power, which was 95,803 MW in 2021 increased to 1,09,885 MW (a growth of 14.70%) during a year (2022) (Table 2.5).
- Out of the total installed generation capacity of renewable sources of power in 2022, installed capacity of Solar power including roof tops accounted for about 49.1%, followed by Wind power (36.7%) and Bio Power & Waste to Energy (9.7%). However, in terms of growth rates year on year, Solar power installed capacity has a growth rate of 30.95% from FY: 2020-21 to FY: 2021-22.
- Rajasthan had the highest installed capacity of grid connected renewable power (17,040.62 MW) in 2022 followed closely by Gujarat (16,587.90 MW) mainly on account of wind and solar power.

Fig 2.4 : Sectorwise percentage distribution of Installed Grid-Interactive Renewable Power Capacity during 2021-22(P)

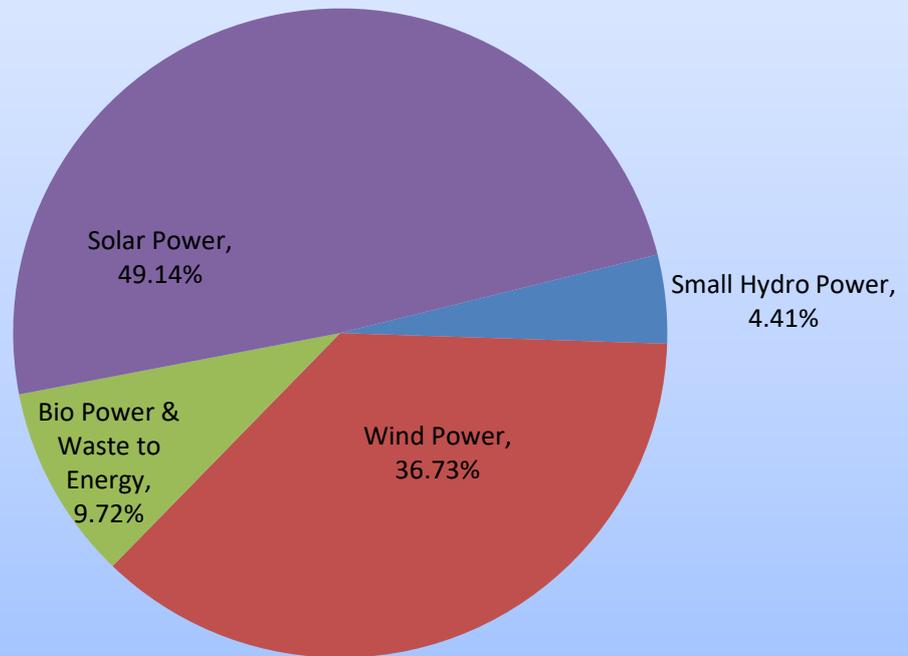
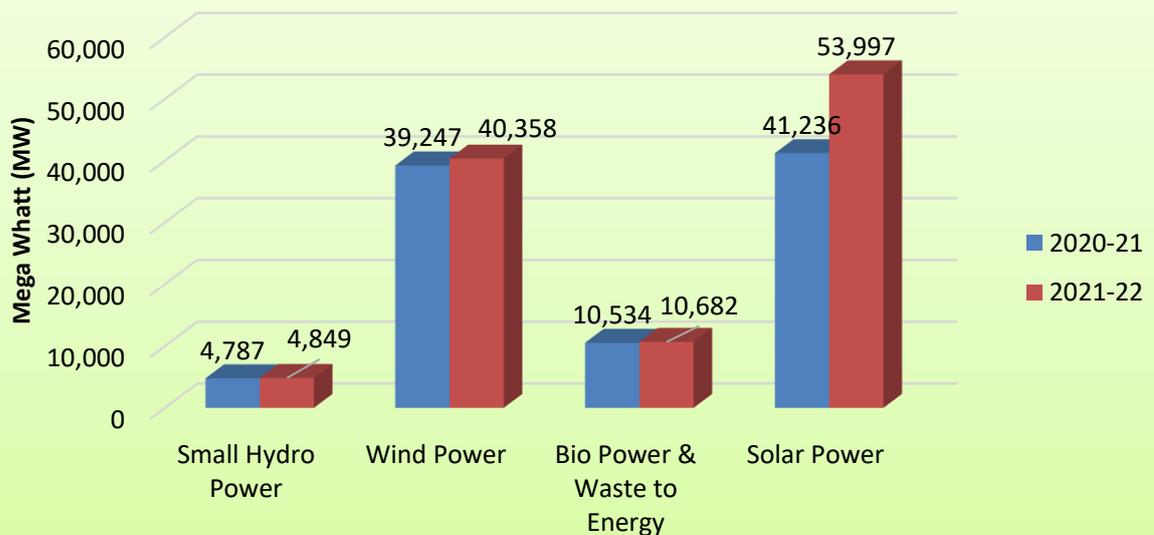


Fig 2.5 : Installed Capacity of Grid-Interactive Renewable Power During 2020-21 and 2021-22(P)



- 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 12.6% over last year. Also, the Solar Photovoltaic Plants (SPV) has registered a growth of 21.9% over last year (Figure 2.6).

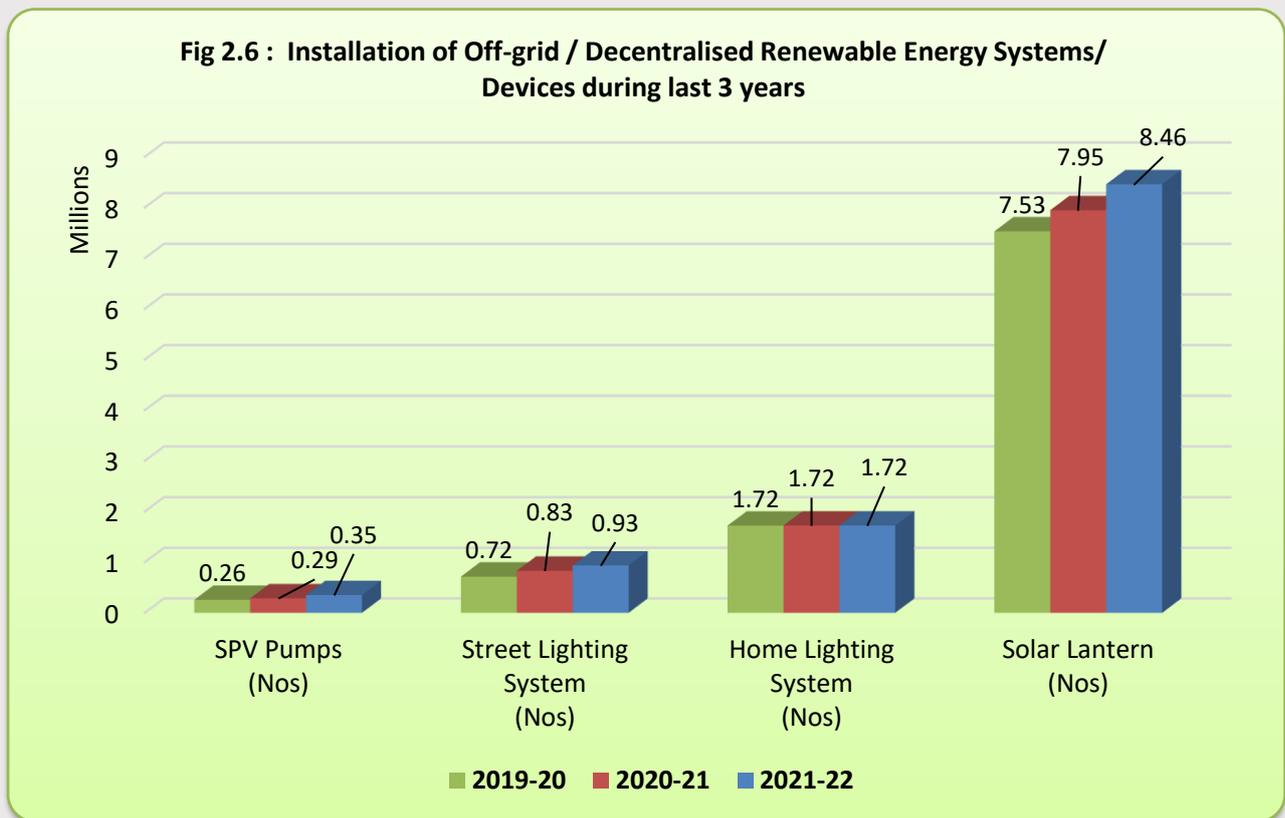


Table 2.1: Installed Capacity of Coal Washeries

| Sl. No. | Washery & Operator | State of Location | Capacity (MTY) 31.03.2022* |
|---|--|-------------------|-------------------------------|
| <u>COKING COAL :</u> | | | |
| 1 | Dudga-II, CIL | Jharkhand | 2.00 |
| 2 | Patherdih, CIL | Jharkhand | 5.00 |
| 3 | Moonidih, CIL | Jharkhand | 1.60 |
| 4 | Sudamdih, CIL | Jharkhand | 1.60 |
| 5 | Mahuda, CIL | Jharkhand | 0.63 |
| 6 | Madhuban, CIL | Jharkhand | 2.50 |
| 7 | Kathara, CIL | Jharkhand | 3.00 |
| 8 | Swang, CIL | Jharkhand | 0.75 |
| 9 | Rajrappa, CIL | Jharkhand | 3.00 |
| 10 | Kedla, CIL | Jharkhand | 2.60 |
| 11 | Nandan, CIL | Madhya Pradesh | 1.20 |
| 12 | Bhojudih, CIL | West Bengal | 1.70 |
| (A) CIL | | | 25.58 |
| 13 | Chasnala, IISCO | Jharkhand | 1.40 |
| 14 | Jamadoba, TISCO | Jharkhand | 2.00 |
| 15 | West Bokaro-II, TISCO | Jharkhand | 2.50 |
| 16 | West Boakaro-III, TISCO | Jharkhand | 4.50 |
| 17 | Bhelatand, TISCO | Jharkhand | 1.20 |
| 18 | Durgapur, SAIL | West Bengal | Closed |
| 19 | DCOP, DPL | West Bengal | Closed |
| (B) PSU & Private | | | 11.60 |
| TOTAL COKING (A + B) | | | 37.18 |
| <u>NON-COKING COAL</u> | | | |
| 1 | Dugda-I, CIL | Jharkhand | 2.00 |
| 2 | Gidi, CIL | Jharkhand | 2.50 |
| 3 | Piparwar, CIL | Jharkhand | 6.50 |
| 4 | Kargali, CIL | Jharkhand | Closed |
| 5 | Bina (De-Shaling Plant) CIL | Uttar Pradesh | Closed |
| (A) CIL | | | 11.00 |
| 6 | Indaram, Aryan Coal Beneficiation Pvt.Ltd. | Andhra Pradesh | 14.00 |
| 7 | Ramagundam, Gupta coalfield & washeries ltd. | Andhra Pradesh | 6.25 |
| 8 | Dipka, Aryan coal beneficiation pvt. Ltd. | Chattisgarh | 2.62 |
| 9 | Gevra, Aryan coal beneficiation pvt. Ltd. | Chattisgarh | 7.50 |
| 10 | Chakabuwa, Aryan Energy private ltd. | Chattisgarh | 5.00 |
| 11 | Binjhari, Aryan Energy private ltd. | Chattisgarh | 4.80 |
| 12 | Korba, ST-CLI Coal washeries ltd. | Chattisgarh | Closed |
| 13 | Bilaspur, Gupta coalfield & washeries ltd. | Chattisgarh | 7.00 |
| * Provisional | | | Contd. ... |
| Source: Office of Coal Controller, Ministry of Coal | | | |

Table 2.1(Contd.): Installed Capacity of Coal Washeries

| Sl. No. | Washery & Operator | State of Location | Capacity (MTY) |
|--|---|-------------------|----------------|
| | | | 31.03.2022* |
| 14 | Tamnar, Jindal Steel & Power Ltd. | Chattisgarh | 2.50 |
| 15 | Ratija, Spectrum Coal & Power Ltd. | Chattisgarh | closed |
| 25 | Maruti Clean Coal | Chattisgarh | 4.00 |
| 26 | AEL,Adani Enterprises Limited | Chattisgarh | 4.00 |
| 16 | Jindal Power Limited(JPL) | Chattisgarh | 1.00 |
| 17 | Dharamsthal, BLA Industries | Madhya Pradesh | closed |
| 18 | Panderpauni, Aryan coal beneficiation pvt. Ltd. | Maharashtra | closed |
| 19 | Wani, Kartikay Coal washeries pvt. ltd.(Aryan) | Maharashtra | closed |
| 20 | Sasti, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 21 | Wani, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 22 | Umrer, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 23 | Bhandara, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 24 | Gondegaon, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 27 | Majri, Gupta coalfield & washeries ltd. | Maharashtra | closed |
| 28 | Ghugus, Gupta coalfield & washeries ltd. | Maharashtra | 0.96 |
| 29 | Wani, Bhatia International Ltd. | Maharashtra | closed |
| 30 | Ghugus, Bhatia International Ltd. | Maharashtra | closed |
| 31 | Wani, Indo Unique Flame Ltd. | Maharashtra | closed |
| 32 | Nagpur, Indo Unique Flame Ltd. | Maharashtra | 4.75 |
| 33 | Punwat, Indo Unique Flame Ltd. | Maharashtra | closed |
| 34 | Himgir, Aryan Energy private ltd. | Odisha | closed |
| 35 | Talcher, Aryan Energy Pvt. Ltd. | Odisha | 2.40 |
| 36 | Talcher, Global coal Mining (P) Ltd. | Odisha | closed |
| 37 | Ib Valley, Global coal Mining (P) Ltd. | Odisha | closed |
| 38 | Jharsuguda, Bhatia International Ltd. | Odisha | 11.00 |
| 39 | Talcher, Spectrum Coal & Power Ltd. | Odisha | 6.60 |
| 40 | Ramagundam, Global coal Mining (P) Ltd. | Telengana | 15.00 |
| 41 | Manuguru, Global coal Mining (P) Ltd. | Telengana | 4.75 |
| | (B) Private | | 104.13 |
| | TOTAL NON-COKING (A+B) | | 115.13 |
| | Gross Total (Coking + Non-Coking) | | 152.31 |
| * Provisional | | | |
| <i>Source: Office of Coal Controller, Ministry of Coal</i> | | | |

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

| Sl. No. | Refinery | Refinery Capacity (TMTPA) | | | Crude Oil Processed (TMT) | | Capacity Utilisation (%) | | |
|---------|--|---------------------------|-----------------|-----------------|---------------------------|-----------------|--------------------------|---------------|-----------------------|
| | | 31.03.2020 | 31.03.2021 | 31.03.2022 | 2020-21 | 2021-22 (P) | 2020-21 | 2021-22 (P) | Change in Utilisation |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| (a) | PUBLIC SECTOR | 1,50,366 | 1,49,716 | 1,51,716 | 1,33,693 | 1,45,491 | 88.91 | 97.18 | 8.27 |
| | IOCL, Guwahati, Assam | 1,000 | 1,000 | 1,000 | 849 | 730 | 84.92 | 73.02 | -11.90 |
| | IOCL, Barauni, Bihar | 6,000 | 6,000 | 6,000 | 5,469 | 5,620 | 91.15 | 93.66 | 2.51 |
| | IOCL, Koyali, Gujarat | 13,700 | 13,700 | 13,700 | 11,603 | 13,474 | 84.69 | 98.35 | 13.66 |
| | IOCL, Haldia, West Bengal | 8,000 | 8,000 | 8,000 | 6,759 | 7,305 | 84.48 | 91.32 | 6.84 |
| | IOCL, Mathura, Uttar Pradesh | 8,000 | 8,000 | 8,000 | 8,926 | 9,123 | 111.57 | 114.04 | 2.46 |
| | IOCL, Digboi, Assam | 650 | 650 | 650 | 605 | 708 | 93.09 | 108.90 | 15.80 |
| | IOCL, Panipat, Haryana | 15,000 | 15,000 | 15,000 | 13,181 | 14,849 | 87.88 | 98.99 | 11.12 |
| | IOCL, Bongaigaon, Assam | 2,350 | 2,700 | 2,700 | 2,450 | 2,639 | 104.27 | 97.72 | -6.55 |
| | IOCL, Paradip, Odisha | 15,000 | 15,000 | 15,000 | 12,508 | 13,217 | 83.39 | 88.12 | 4.73 |
| | Total IOC | 69,700 | 70,050 | 70,050 | 62,351 | 67,665 | 89.46 | 96.60 | 7.14 |
| | BPCL, Mumbai, Maharashtra | 12,000 | 12,000 | 12,000 | 12,941 | 14,437 | 107.84 | 120.30 | 12.47 |
| | BPCL, Kochi, Kerala | 15,500 | 15,500 | 15,500 | 13,282 | 15,402 | 85.69 | 99.36 | 13.68 |
| | BPCL, Bina, Madhya Pradesh | 7,800 | 7,800 | 7,800 | 6,190 | 7,410 | 79.35 | 95.00 | 15.64 |
| | Total BPCL | 35,300 | 35,300 | 35,300 | 32,412 | 37,248 | 91.82 | 105.52 | 13.70 |
| | HPCL, Mumbai, Maharashtra | 7,500 | 7,500 | 9,500 | 7,374 | 5,558 | 98.32 | 74.10 | -24.22 |
| | HPCL, Visakh, Andhra Pradesh | 8,300 | 8,300 | 8,300 | 9,050 | 8,410 | 109.04 | 101.32 | -7.72 |
| | Total HPCL | 15,800 | 15,800 | 17,800 | 16,425 | 13,968 | 103.95 | 88.40 | -15.55 |
| | CPCL, Manali, Tamil Nadu | 10,500 | 10,500 | 10,500 | 8,243 | 9,040 | 78.50 | 86.10 | 7.60 |
| | CPCL, Narimanam, Tamil Nadu | 1,000 | - | - | - | - | - | - | - |
| | Total CPCL | 11,500 | 10,500 | 10,500 | 8,243 | 9,040 | 71.68 | 86.10 | 14.42 |
| | NRL, Numaligarh, Assam | 3,000 | 3,000 | 3,000 | 2,707 | 2,624 | 90.25 | 87.48 | -2.76 |
| | MRPL, Mangalore, Kamataka | 15,000 | 15,000 | 15,000 | 11,475 | 14,871 | 76.50 | 99.14 | 22.64 |
| | ONGC, Tatipaka, Andhra Pradesh | 66 | 66 | 66 | 81 | 75 | 122.71 | 113.84 | -8.87 |
| (b) | PRIVATE SECTOR & JVs SECTOR | 99,500 | 99,500 | 99,500 | 88,080 | 96,212 | 88.52 | 96.70 | 8.17 |
| | RIL, Jamnagar, Gujarat | 33,000 | 33,000 | 33,000 | 34,100 | 34,757 | 103.33 | 105.32 | 1.99 |
| | RIL, SEZ-Jamnagar, Gujarat | 35,200 | 35,200 | 35,200 | 26,841 | 28,264 | 76.25 | 80.30 | 4.04 |
| | Nyara Energy Ltd. Vadinar | 20,000 | 20,000 | 20,000 | 17,067 | 20,164 | 85.34 | 100.82 | 15.49 |
| | HMEL, GGS, Bathinda, Punjab | 11,300 | 11,300 | 11,300 | 10,072 | 13,027 | 89.13 | 115.28 | 26.15 |
| | Total (a+b) | 2,49,866 | 2,49,216 | 2,51,216 | 2,21,773 | 2,41,703 | 88.76 | 96.99 | 8.23 |

Note: 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

Chapter 2 : Installed capacity and capacity utilization

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

(in Mega Watt = 10³ Kilo Watt)

| As on | Utilities | | | | | | | |
|---|-------------|--------------|--------------|-------------|-------------|-------------|--------------|-------------|
| | Thermal | | | | Hydro | Nuclear | RES* | Total |
| | Steam | Diesel | Gas | Total | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 31.03.2012 | 1,12,022 | 1,200 | 18,381 | 1,31,603 | 38,990 | 4,780 | 24,503 | 1,99,877 |
| 31.03.2013 | 1,30,221 | 1,200 | 20,110 | 1,51,530 | 39,491 | 4,780 | 27,542 | 2,23,344 |
| 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 (P) | 2,10,700 | 510 | 24,900 | 2,36,109 | 46,723 | 6,780 | 1,09,885 | 3,99,497 |
| Growth rate of 2021-22 over 2020-21(%) | 0.7% | 0.0% | -0.1% | 0.6% | 1.1% | 0.0% | 16.4% | 4.5% |
| CAGR 2012-13 to 2021-22 (%) | 5.5% | -9.1% | 2.4% | 5.1% | 1.9% | 4.0% | 16.6% | 6.7% |

Note:

* RES= Renewable Energy Sources excluding Hydro

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) : Yearwise Installed Capacity of Electricity Generation in Utilities and Non-utilities

(in Mega Watt = 10³ x Kilo Watt)

| As on | Non-Utilities | | | | | | | |
|---|---------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------------------------------|
| | Thermal | | | | Hydro | RES* | Total | Grand Total (Utility + Non-Utility) |
| | Steam | Diesel | Gas | Total | | | | |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17= 9+16 |
| 31.03.2012 | 22,615 | 9,955 | 5,885 | 38,456 | 48 | 872 | 39,375 | 2,39,252 |
| 31.03.2013 | 23,890 | 11,148 | 4,498 | 39,535 | 67 | 1,124 | 40,726 | 2,64,070 |
| 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 (P) | 51,000 | 17,700 | 7,400 | 76,100 | 135 | 6,500 | 82,735 | 4,82,232 |
| Growth rate of 2021-22 over 2020-21(%) | 6.8% | 0.8% | 0.5% | 4.7% | 3.3% | 14.2% | 5.4% | 4.7% |
| CAGR** 2012-13 to 2021-22(%) | 8.8% | 5.3% | 5.7% | 7.5% | 8.1% | 21.5% | 8.2% | 6.9% |

* RES= Renewable Energy Sources excluding Hydro

** 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.

Chapter 2 : Installed capacity and capacity utilization

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

| States/UTs | (in GW) | | | | | | | | | | |
|------------------------|--------------|--------------|---------------|---------------|-------------|-------------|--------------|---------------|---------------|---------------|--|
| | Hydro | | Thermal | | Nuclear | | RES* | | Total | | Growth Rate (2020-21 to 2021-22) (%) |
| | 31.03.2021 | 31.03.2022 | 31.03.2021 | 31.03.2022 | 31.03.2021 | 31.03.2022 | 31.03.2021 | 31.03.2022 | 31.03.2021 | 31.03.2022 | |
| Chandigarh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.06 | 0.05 | 0.06 | 22.17 |
| Delhi | 0.00 | 0.00 | 2.36 | 2.36 | 0.00 | 0.00 | 0.24 | 0.27 | 2.60 | 2.63 | 9.97 |
| Haryana | 0.20 | 0.20 | 4.82 | 4.82 | 0.00 | 0.00 | 0.69 | 1.24 | 5.71 | 6.26 | 9.61 |
| Himachal Pradesh | 2.59 | 2.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.99 | 1.04 | 3.58 | 3.96 | 10.55 |
| Jammu & Kashmir | 1.23 | 1.23 | 0.18 | 0.18 | 0.00 | 0.00 | 0.21 | 0.24 | 1.61 | 1.64 | 2.01 |
| Punjab | 1.24 | 1.24 | 6.92 | 6.92 | 0.00 | 0.00 | 1.62 | 1.77 | 9.78 | 9.94 | 1.54 |
| Rajasthan | 0.43 | 0.43 | 10.97 | 11.63 | 0.00 | 0.00 | 9.86 | 16.70 | 21.26 | 28.76 | 35.25 |
| Uttar Pradesh | 0.72 | 0.72 | 12.77 | 13.43 | 0.00 | 0.00 | 3.85 | 4.45 | 17.35 | 18.61 | 7.29 |
| Uttarakhand | 2.08 | 2.08 | 0.55 | 0.55 | 0.00 | 0.00 | 0.71 | 0.93 | 3.34 | 3.56 | 6.55 |
| Central Sector NR | 11.52 | 11.53 | 15.54 | 15.54 | 1.62 | 1.62 | 0.38 | 0.38 | 29.06 | 29.08 | 0.06 |
| Sub-Total (NR) | 20.02 | 20.36 | 54.12 | 55.44 | 1.62 | 1.62 | 18.59 | 27.07 | 94.34 | 104.49 | 10.75 |
| Chhattisgarh | 0.12 | 0.12 | 16.01 | 16.01 | 0.00 | 0.00 | 0.57 | 0.87 | 16.70 | 17.00 | 1.77 |
| Gujarat | 0.77 | 0.77 | 20.23 | 20.23 | 0.00 | 0.00 | 12.91 | 16.34 | 33.91 | 37.35 | 10.13 |
| Madhya Pradesh | 1.70 | 1.70 | 11.80 | 11.80 | 0.00 | 0.00 | 4.91 | 5.17 | 18.40 | 18.67 | 1.43 |
| Maharashtra | 3.33 | 3.33 | 23.37 | 22.26 | 0.00 | 0.00 | 10.14 | 10.53 | 36.84 | 36.12 | -1.95 |
| Daman & Diu | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | 0.04 | 0.04 | 0.42 |
| 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 | 0.01 | 0.02 | 0.06 | 0.07 | 22.41 |
| 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 | 93.73 | 92.62 | 1.84 | 1.84 | 29.25 | 33.65 | 132.27 | 135.55 | 2.49 |
| Andhra Pradesh | 1.67 | 1.67 | 12.30 | 12.30 | 0.00 | 0.00 | 8.72 | 8.96 | 22.70 | 22.94 | 1.07 |
| Telangana | 2.48 | 2.48 | 7.19 | 7.46 | 0.00 | 0.00 | 4.37 | 4.95 | 14.04 | 14.89 | 6.06 |
| Karnataka | 3.59 | 3.63 | 7.11 | 7.11 | 0.00 | 0.00 | 15.46 | 15.90 | 26.15 | 26.64 | 1.86 |
| Kerala | 1.86 | 1.86 | 0.33 | 0.33 | 0.00 | 0.00 | 0.50 | 0.62 | 2.69 | 2.81 | 4.42 |
| Tamil Nadu | 2.18 | 2.18 | 8.51 | 9.03 | 0.00 | 0.00 | 15.00 | 15.92 | 25.68 | 27.13 | 5.62 |
| Puducherry | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 | 0.05 | 10.42 |
| Lakshadweep | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 336.00 |
| 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) | 11.77 | 11.82 | 48.73 | 49.52 | 3.32 | 3.32 | 44.60 | 46.91 | 108.42 | 111.57 | 2.91 |
| Bihar | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.39 | 0.35 | 0.39 | 9.14 |
| Jharkhand | 0.13 | 0.13 | 2.25 | 2.25 | 0.00 | 0.00 | 0.06 | 0.10 | 2.44 | 2.48 | 1.51 |
| Odisha | 2.06 | 2.07 | 5.54 | 4.94 | 0.00 | 0.00 | 0.54 | 0.61 | 8.14 | 7.62 | -6.39 |
| West Bengal | 0.99 | 0.99 | 7.43 | 6.95 | 0.00 | 0.00 | 0.57 | 0.59 | 8.98 | 8.52 | -5.14 |
| Sikkim | 0.76 | 0.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.06 | 0.81 | 0.93 | 14.50 |
| A. & N. Islands | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.03 | 0.03 | 0.07 | 0.07 | 0.39 |
| Central Sector ER \$ | 1.01 | 1.01 | 20.37 | 21.85 | 0.00 | 0.00 | 0.02 | 0.02 | 21.39 | 22.87 | 6.92 |
| Sub-Total (ER) | 4.94 | 5.07 | 35.63 | 36.03 | 0.00 | 0.00 | 1.62 | 1.78 | 42.19 | 42.87 | 1.62 |
| Arunachal Pradesh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.14 | 0.14 | 0.14 | 4.11 |
| Assam | 0.10 | 0.10 | 0.35 | 0.33 | 0.00 | 0.00 | 0.05 | 0.13 | 0.51 | 0.56 | 9.93 |
| Manipur | 0.00 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 | 0.01 | 0.02 | 0.05 | 0.05 | 12.32 |
| Meghalaya | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.37 | 0.37 | 1.09 |
| Mizoram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | 0.04 | 0.04 | 16.76 |
| Nagaland | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.03 | 0.03 | 6.44 |
| Tripura | 0.00 | 0.00 | 0.14 | 0.14 | 0.00 | 0.00 | 0.02 | 0.03 | 0.16 | 0.16 | 3.48 |
| 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 | 2.53 | 2.51 | 0.00 | 0.00 | 0.37 | 0.47 | 4.93 | 5.01 | 1.62 |
| Total States | 30.56 | 31.06 | 161.28 | 161.18 | 0.00 | 0.00 | 92.80 | 108.25 | 284.64 | 300.49 | 5.57 |
| Total Central | 15.65 | 15.66 | 73.45 | 74.93 | 6.78 | 6.78 | 1.63 | 1.63 | 97.51 | 99.00 | 1.54 |
| Total All India | 46.21 | 46.72 | 234.73 | 236.11 | 6.78 | 6.78 | 94.43 | 109.89 | 382.15 | 399.50 | 4.54 |

\$ 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.

Chapter 2 : Installed capacity and capacity utilization

Table 2.5: State-wise cumulative Installed Capacity of Grid Interactive Renewable Power as on 31.03.2022

| S. No. | STATES / UTs | Small Hydro Power | | Wind Power | | Bio-Power-BM Power/Cogen | | Waste to Energy | | Solar Power | | Total Capacity | | Growth Rate(2020-21 to 2021-22) | |
|-----------------------|----------------------|-------------------|----------------|-----------------|-----------------|--------------------------|-----------------|-----------------|---------------|-----------------|-----------------|-----------------|------------------|---------------------------------|-------|
| | | (MW) | | (MW) | | (MW) | | (MW) | | (MW) | | (MW) | | | |
| | | 2020-21 | 2021-22 | 2020-21 | 2021-22 | 2020-21 | 2021-22 | 2020-21 | 2021-22 | 2020-21 | 2021-22 | 2020-21 | 2021-22 | | |
| 1 | Andhra Pradesh | 162.11 | 162.11 | 4096.65 | 4096.65 | 483.67 | 483.67 | 52.37 | 82.37 | 4291.34 | 4386.76 | 9086.14 | 9211.56 | 1.38% | |
| 2 | Arunachal Pradesh | 131.11 | 131.11 | | | 0.00 | 0.00 | 0.00 | 0.00 | 10.16 | 11.23 | 141.27 | 142.34 | 0.76% | |
| 3 | Assam | 34.11 | 34.11 | | | 2.00 | 2.00 | 0.00 | 0.00 | 51.56 | 117.94 | 87.67 | 154.05 | 75.72% | |
| 4 | Bihar | 70.70 | 70.70 | | | 124.70 | 124.70 | 1.00 | 1.32 | 180.23 | 190.63 | 376.63 | 387.35 | 2.85% | |
| 5 | Chhatisgarh | 76.00 | 76.00 | | | 244.90 | 274.59 | 0.41 | 0.41 | 445.21 | 518.08 | 766.52 | 869.08 | 13.38% | |
| 6 | Goa | 0.05 | 0.05 | | | 0.00 | 0.00 | 0.34 | 0.34 | 7.56 | 19.95 | 7.95 | 20.34 | 155.85% | |
| 7 | Gujarat | 82.69 | 89.39 | 8561.82 | 9209.22 | 77.30 | 77.30 | 22.57 | 31.96 | 4469.87 | 7180.03 | 13214.25 | 16587.90 | 25.53% | |
| 8 | Haryana | 73.50 | 73.50 | | | 210.66 | 240.66 | 6.09 | 17.34 | 472.26 | 910.63 | 762.51 | 1242.13 | 62.90% | |
| 9 | Himachal Pradesh | 936.11 | 954.11 | | | 9.20 | 9.20 | 1.00 | 1.00 | 50.28 | 76.16 | 996.59 | 1040.47 | 4.40% | |
| 10 | Jammu & Kashmir | 185.98 | 184.32 | | | 0.00 | 0.00 | 0.00 | 0.00 | 42.13 | 54.73 | 228.11 | 239.05 | 4.80% | |
| 11 | Jharkhand | 4.05 | 4.05 | | | 4.30 | 4.30 | 0.00 | 0.00 | 69.86 | 88.79 | 78.21 | 97.14 | 24.20% | |
| 12 | Karnataka | 1280.73 | 1280.73 | 4938.60 | 5130.90 | 1887.30 | 1887.30 | 14.62 | 14.85 | 7383.88 | 7590.81 | 15505.13 | 15904.59 | 2.58% | |
| 13 | Kerala | 230.02 | 242.52 | 62.50 | 62.50 | 2.27 | 2.27 | 0.23 | 0.23 | 277.40 | 363.18 | 572.42 | 670.70 | 17.17% | |
| 14 | Madhya Pradesh | 99.71 | 99.71 | 2519.89 | 2519.89 | 107.35 | 107.35 | 20.31 | 23.98 | 2544.71 | 2717.95 | 5291.97 | 5468.88 | 3.34% | |
| 15 | Maharashtra | 379.58 | 381.08 | 5000.33 | 5012.83 | 2584.40 | 2584.40 | 47.75 | 47.75 | 2323.79 | 2631.02 | 10335.85 | 10657.08 | 3.11% | |
| 16 | Manipur | 5.45 | 5.45 | | | 0.00 | 0.00 | 0.00 | 0.00 | 11.39 | 12.25 | 16.84 | 17.70 | 5.11% | |
| 17 | Meghalaya | 32.53 | 32.53 | | | 13.80 | 13.80 | 0.00 | 0.00 | 3.85 | 4.15 | 50.18 | 50.48 | 0.60% | |
| 18 | Mizoram | 36.47 | 36.47 | | | 0.00 | 0.00 | 0.00 | 0.00 | 6.98 | 7.90 | 43.45 | 44.37 | 2.12% | |
| 19 | Nagaland | 30.67 | 30.67 | | | 0.00 | 0.00 | 0.00 | 0.00 | 2.91 | 3.04 | 33.58 | 33.71 | 0.39% | |
| 20 | Odisha | 88.63 | 106.63 | | | 59.22 | 59.22 | 0.00 | 0.00 | 425.53 | 451.24 | 573.38 | 617.09 | 7.62% | |
| 21 | Punjab | 173.55 | 176.10 | | | 473.45 | 473.45 | 18.20 | 18.20 | 982.30 | 1100.07 | 1647.50 | 1767.82 | 7.30% | |
| 22 | Rajasthan | 23.85 | 23.85 | 4326.82 | 4326.82 | 121.25 | 121.25 | 3.83 | 3.83 | 5925.60 | 12564.87 | 10401.35 | 17040.62 | 63.83% | |
| 23 | Sikkim | 52.11 | 52.11 | | | 0.00 | 0.00 | 0.00 | 0.00 | 1.94 | 4.68 | 54.05 | 56.79 | 5.07% | |
| 24 | Tamil Nadu | 123.05 | 123.05 | 9608.04 | 9866.37 | 1012.65 | 1012.65 | 27.26 | 30.05 | 4527.47 | 5067.18 | 15298.47 | 16099.30 | 5.23% | |
| 25 | Telangana | 90.87 | 90.87 | 128.10 | 128.10 | 160.10 | 160.10 | 50.38 | 59.64 | 3961.54 | 4520.48 | 4390.99 | 4959.19 | 12.94% | |
| 26 | Tripura | 16.01 | 16.01 | | | 0.00 | 0.00 | 0.00 | 0.00 | 13.56 | 14.89 | 29.57 | 30.90 | 4.50% | |
| 27 | Uttar Pradesh | 49.10 | 49.10 | | | 2117.26 | 2117.26 | 58.84 | 72.73 | 1836.27 | 2244.43 | 4061.47 | 4483.52 | 10.39% | |
| 28 | Uttarakhand | 214.32 | 218.82 | | | 130.22 | 130.22 | 9.22 | 9.22 | 380.13 | 573.54 | 733.89 | 931.80 | 26.97% | |
| 29 | West Bengal | 98.50 | 98.50 | | | 319.92 | 319.92 | 1.17 | 2.53 | 162.65 | 166.00 | 582.24 | 586.95 | 0.81% | |
| 30 | Andaman & Nicobar | 5.25 | 5.25 | | | | | 0.00 | 0.00 | 29.46 | 29.49 | 34.71 | 34.74 | 0.09% | |
| 31 | Chandigarh | | | | | | | 0.00 | 0.00 | 45.97 | 55.17 | 45.97 | 55.17 | 20.01% | |
| 32 | Dadar & Nagar Haveli | | | | | | | 0.00 | 0.00 | 5.46 | 5.46 | 5.46 | 5.46 | 0.00% | |
| 33 | Daman & Diu | | | | | | | 0.00 | 0.00 | 40.55 | 40.72 | 40.55 | 40.72 | 0.42% | |
| 34 | Delhi | | | | | | | 0.00 | 52.00 | 59.00 | 194.43 | 211.12 | 246.43 | 270.12 | 9.61% |
| 35 | Lakshwadeep | | | | | | | 0.00 | 0.00 | 0.00 | 3.27 | 3.27 | 3.27 | 0.00% | |
| 36 | Puducherry | | | | | | | 0.00 | 0.00 | 9.51 | 13.69 | 9.51 | 13.69 | 43.95% | |
| 37 | Others | | | 4.30 | 4.30 | | | 0.00 | 0.00 | 45.01 | 45.01 | 49.31 | 49.31 | 0.00% | |
| Total (MW) | | 4786.81 | 4848.90 | 39247.05 | 40357.58 | 10145.92 | 10205.61 | 387.59 | 476.75 | 41236.02 | 53996.54 | 95803.39 | 109885.38 | 14.70% | |
| % Distribution | | 5.0% | 4.4% | 41.0% | 36.7% | 10.6% | 9.3% | 0.4% | 0.4% | 43.0% | 49.1% | 100.0% | 100.0% | | |

Source: Ministry of New and Renewable Energy

Chapter 2 : Installed capacity and capacity utilization

Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2022

| Sl. No. | State/UT | Biogas Plants** (Nos) | SPV Pumps (Nos.) | Solar Photovoltaic (SPV) Systems | | | | Waste to Energy (MW)** |
|--------------|----------------------|-----------------------|------------------|----------------------------------|------------------|------------------|-----------------|------------------------|
| | | | | SLS | HLS | SL | PP | |
| | | | | (Nos.) | (Nos.) | (Nos.) | (KWP) | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 |
| 1 | Andhra Pradesh | 2,68,598 | 34,045 | 16,460 | 22,972 | 77,803 | 3,816 | 29.20 |
| 2 | Arunachal Pradesh | 3,621 | 22 | 25,008 | 35,065 | 2,18,551 | 963 | - |
| 3 | Assam | 1,39,414 | 45 | 29,330 | 46,879 | 6,47,761 | 1,605 | - |
| 4 | Bihar | 1,30,072 | 2,813 | 52,431 | 12,303 | 17,35,227 | 6,905 | 1.00 |
| 5 | Chhattisgarh | 60,250 | 61,970 | 4,449 | 42,232 | 3,311 | 31,373 | 0.41 |
| 6 | Goa | 4,234 | 45 | 707 | 393 | 1,093 | 33 | - |
| 7 | Gujarat | 4,35,638 | 11,981 | 5,004 | 9,253 | 31,603 | 13,577 | 22.58 |
| 8 | Haryana | 64,013 | 33,901 | 34,625 | 56,727 | 93,853 | 2,321 | 4.89 |
| 9 | Himachal Pradesh | 47,718 | 231 | 98,500 | 22,592 | 33,909 | 1,906 | 1.00 |
| 10 | Jammu & Kashmir | 3,201 | 142 | 38,826 | 1,44,316 | 51,224 | 8,130 | - |
| 11 | Jharkhand | 7,890 | 11,387 | 14,344 | 9,450 | 7,90,515 | 3,770 | - |
| 12 | Karnataka | 5,12,755 | 7,734 | 5,694 | 52,638 | 7,781 | 7,854 | 13.62 |
| 13 | Kerala | 1,53,666 | 818 | 1,735 | 41,912 | 54,367 | 16,268 | 0.23 |
| 14 | Madhya Pradesh | 3,79,154 | 25,047 | 16,673 | 7,920 | 5,29,101 | 3,654 | 4.90 |
| 15 | Maharashtra | 9,31,313 | 13,741 | 10,420 | 3,497 | 2,39,297 | 3,858 | 35.16 |
| 16 | Manipur | 2,128 | 68 | 32,347 | 24,583 | 69,722 | 1,581 | - |
| 17 | Meghalaya | 11,156 | 54 | 5,800 | 14,874 | 97,360 | 2,004 | - |
| 18 | Mizoram | 5,857 | 37 | 20,325 | 12,060 | 1,55,217 | 3,895 | - |
| 19 | Nagaland | 7,953 | 3 | 16,045 | 1,045 | 30,766 | 1,506 | - |
| 20 | Odisha | 2,71,752 | 10,308 | 18,479 | 5,274 | 99,843 | 2,322 | - |
| 21 | Punjab | 1,87,145 | 11,079 | 43,508 | 8,626 | 17,495 | 2,066 | 7.45 |
| 22 | Rajasthan | 72,886 | 75,748 | 8,669 | 1,87,968 | 2,25,851 | 30,449 | 3.83 |
| 23 | Sikkim | 9,044 | - | 504 | 15,059 | 45,200 | 850 | - |
| 24 | Tamil Nadu | 2,24,037 | 6,646 | 41,121 | 2,98,641 | 16,818 | 13,053 | 20.86 |
| 25 | Telangana | 3,16,727 | 424 | 2,458 | - | 1,42,000.0 | 7,450 | 4.59 |
| 26 | Tripura | 3,744 | 572 | 15,177 | 32,723 | 3,64,012 | 867 | - |
| 27 | Uttar Pradesh | 4,41,180 | 35,492 | 2,97,961 | 2,35,909 | 23,51,205 | 10,638 | 58.84 |
| 28 | Uttarakhand | 3,65,188 | 26 | 43,723 | 91,595 | 1,65,071 | 4,060 | 9.22 |
| 29 | West Bengal | 1,216 | 653 | 17,894 | 1,45,332 | 17,662 | 1,730 | 1.17 |
| 30 | Andaman & Nicobar | 97 | 5 | 1,490 | 468 | 6,296 | 167 | - |
| 31 | Chandigarh | 169 | 12 | 901 | 275 | 1,675 | 730 | - |
| 32 | Dadar & Nagar Haveli | 681 | - | - | - | - | 0 | - |
| 33 | Daman & Diu | - | - | - | - | - | 0 | - |
| 34 | Delhi | 578 | 90 | 301 | - | 4,807 | 1,269 | - |
| 35 | Lakshadweep | - | - | 4,465 | 600 | 5,289 | 2,190 | - |
| 36 | Puducherry | 17,541 | 21 | 417 | 25 | 1,637 | 121 | - |
| 37 | Others* | - | 4,621 | 9,150 | 1,40,273 | 1,25,797 | 23,885 | - |
| Total | | 50,80,616 | 3,49,781 | 9,34,941 | 17,23,479 | 84,59,119 | 2,16,863 | 219 |

* Others includes installations through NGOs/IREDA in different states

** Updated upto 31.03.2021

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