

Chapter

Availability of Energy Resources

5



CHAPTER 5

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Availability

The availability of and access to energy and energy sources are particularly essential for poverty reduction and further improvements in standards of living.

Data on availability of energy resources within the national territory of a given country during a reference period along with reliable and timely monitoring of the supply and use of energy becomes indispensable for sound decision-making.

Data items, particularly, on mineral and energy resources are important for the assessment of their availability in the environment, as well as for the assessment of their depletion. This information is often used in the compilation of asset accounts in the SNA, as well as in SEEA-Energy accounts to assess their availability in the long run.

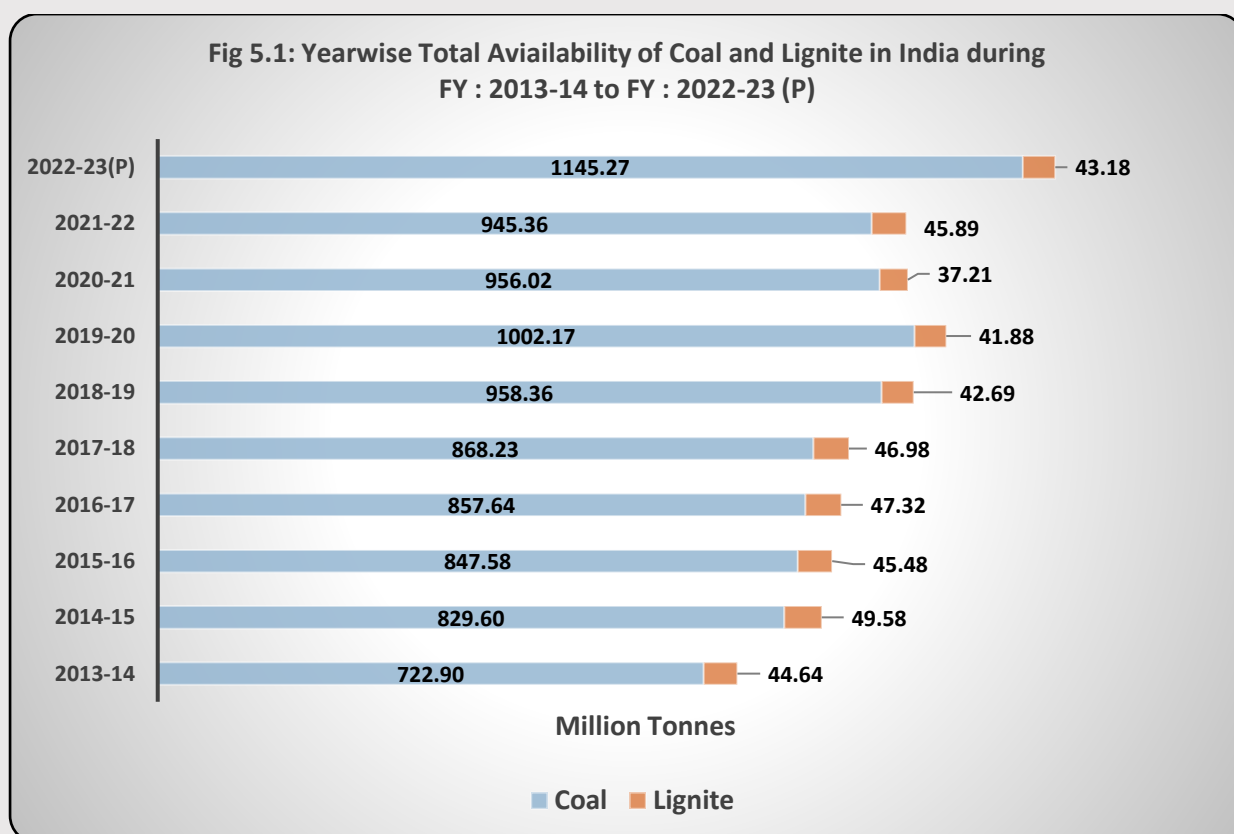
More importantly, it is essential for countries to track their depletion of energy related natural resources, as this directly affects their availability for future generations and increasing dependence of an economy on trade to balance the deficit. Thus, there has been a thrust to rely on renewable and cleaner forms of energy in the recent years, world over, - to bridge the gap between demand and supply without affecting the environment drastically.

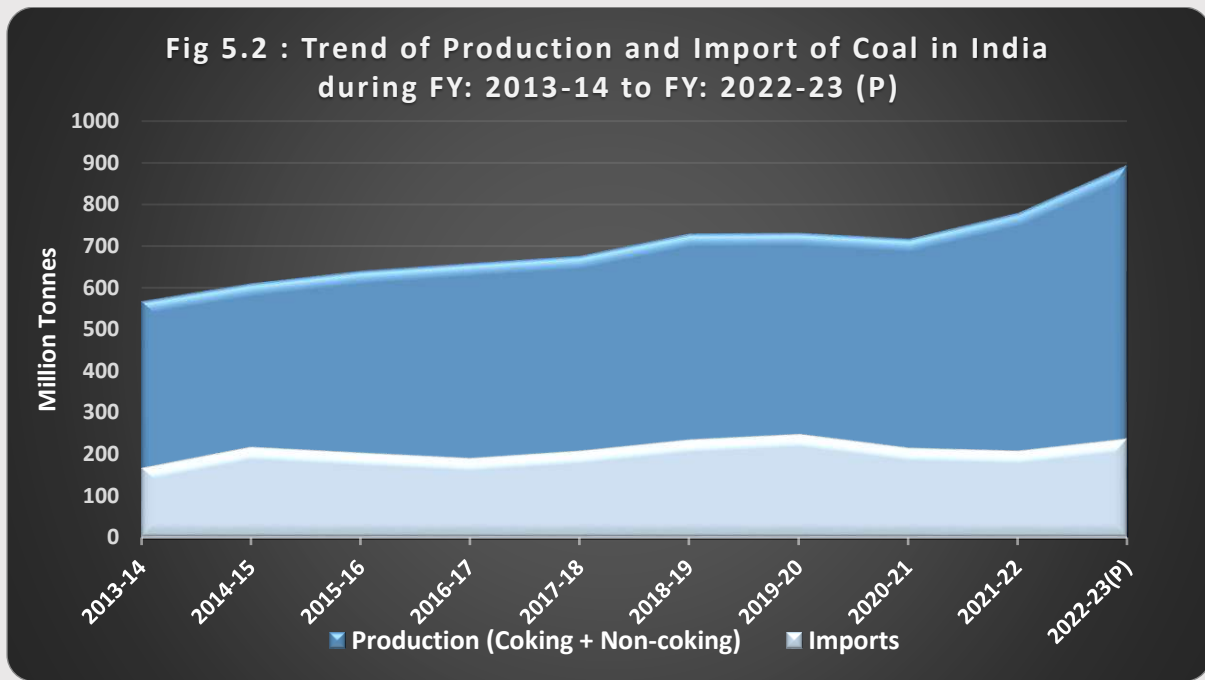
The necessity of Energy security in the current world and availability of energy being an enabler of life improvement, access and availability of Clean Energy for all has been recognized as an agenda point of the Sustainable Development Goals which are to be achieved by countries till 2030.

This chapter presents the availability of primary energy resources, petroleum products and electricity in the economy.

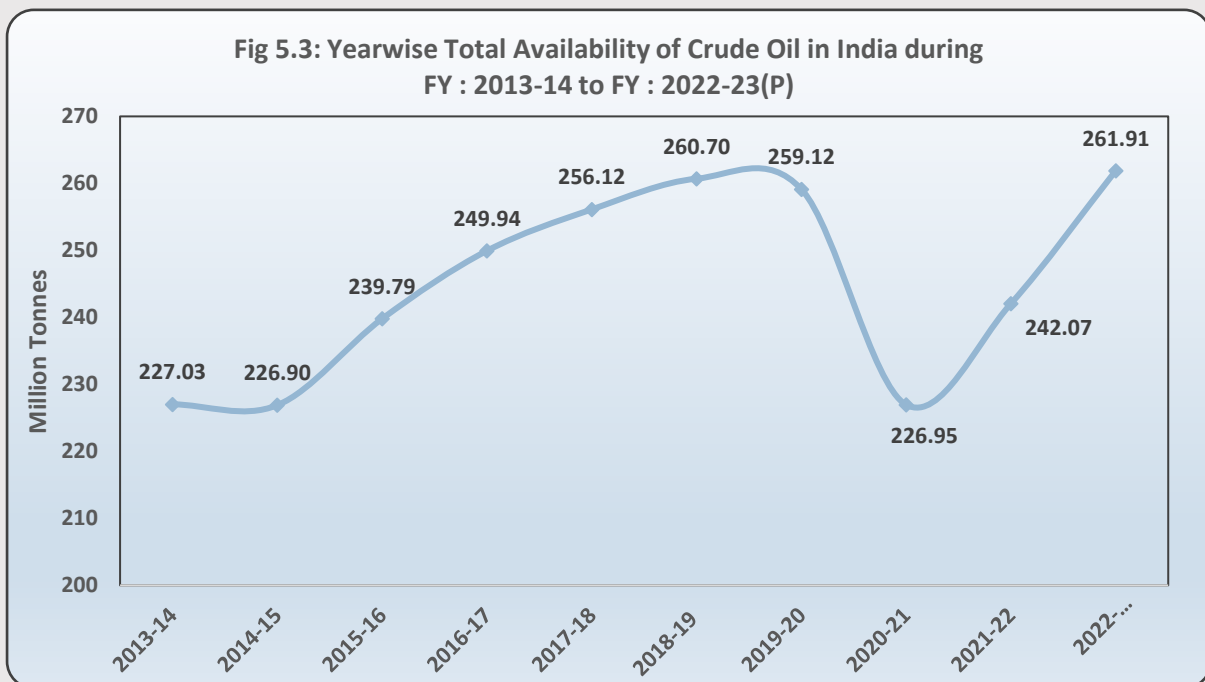
Highlights

- Over the year 2022-23 (P), in comparison to the year 2021-22, the availability of energy resources has experienced an increase for both Coal and Crude Oil. The availability of Coal has increased by 21.15% during FY:2022-23(P), in comparison with previous Financial year. The availability of Lignite, Crude Oil and Natural Gas oil have experienced a growth of -5.92%, 8.20% and -6.54% respectively during FY:2022-23 (P), w.r.t FY:2021-22. (Table 5.1).
- India, being one of the largest reservoirs of Coal, has displayed a steady increase in availability of Coal during the period from 2013-14 to 2022-23(P) with a CAGR of about 5.25%, except for small decline of 4.61% from 2019-20 and 1.07% from 2020-21. The total availability of Coal in 2022-23(P) stood at 1145.27 MT as compared to 945.36 MT in 2021-22 indicating a significant increase of close to 200 MT over a year. Out of the 1145.27 MT available for consumption in 2022-23(P), a major portion (78%) is produced domestically and 237.67 MT of Coal has been imported (Table 5.1 & 5.2). An overview of availability of Coal and Lignite in India is given below,





- The total availability of crude oil experienced a steep downfall of 32.17 MT during FY:2020-21 w.r.t FY:2019-20; a decline of close to 12% over previous year, primarily because of COVID-19 pandemic. The same, however has bounced back and registered a growth of 8.20% during FY:2022-23(P) over last year (from 242.07 MT in 2021-22 to 261.91 MT during 2022-23(P)). The overall CAGR between 2013-14 to 2022-23(P) has also remained positive (1.60%).

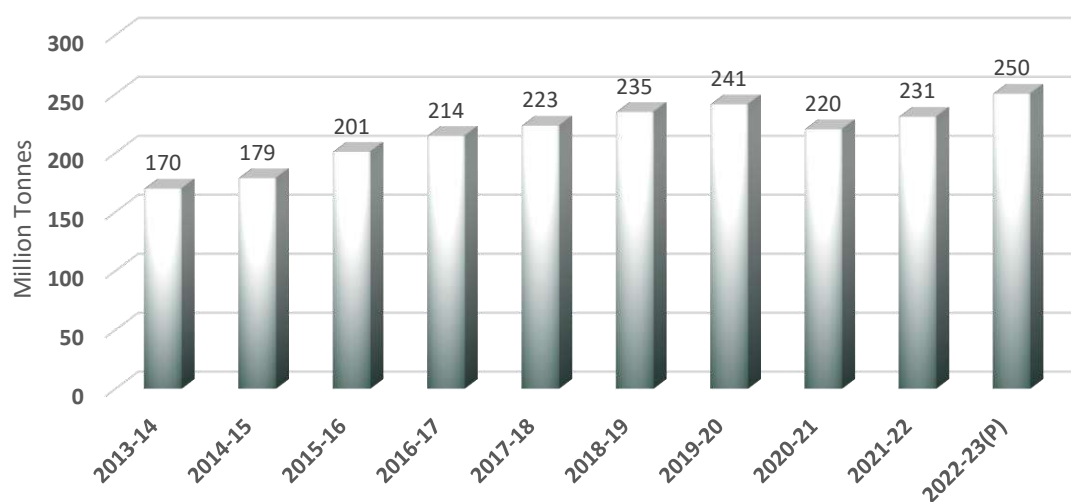


- Like in all developing countries, India has also experienced a steady growth rate of Petroleum Products over time. A production of 203.20 MTs in 2011-12 to 262.94 MTs in 2019-20 i.e. an increase of over 29% has been registered. But during 2020-21,

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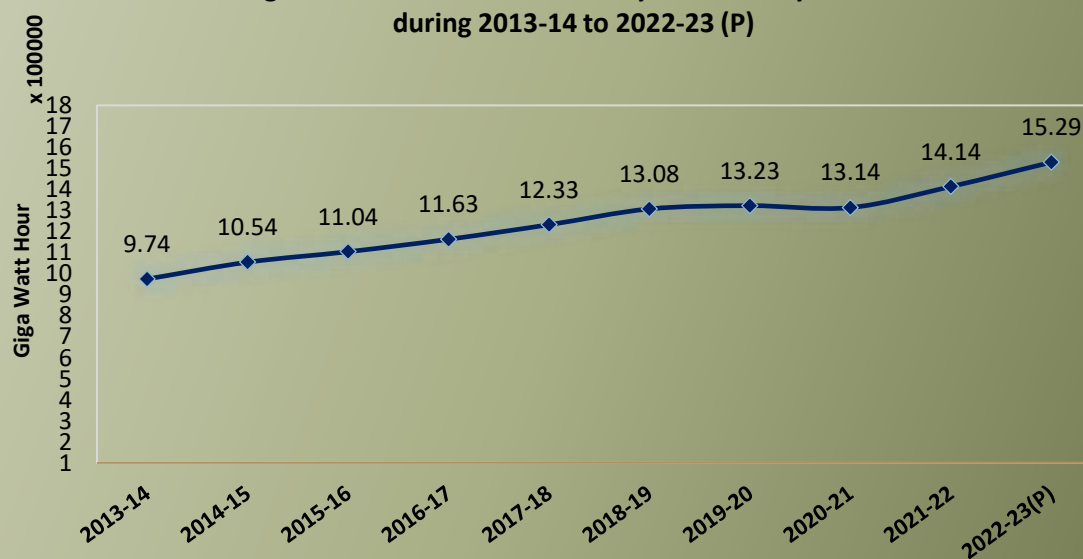
primarily because of COVID-19, the same has been decreased to 233.51 MTs, a decline of 11.19% over 2019-20. The total availability of Petroleum Products, however, has experience a healthy growth of close to 8.45% during FY:2022-23(P) and has reached to 250.04. The CAGR of total availability of Petroleum products between 2013-14 to 2022-23(P) has shown a growth of 4.41% (Table 5.3).

Fig 5.4: Yearwise Total Availability of petroleum products in India during FY : 2013-14 to FY : 2021-22(P)



- Electricity available for supply has increased from 9,74,436 GWh in 2013-14 to 15,29,471 GWh in 2022-23(P), thus recording a CAGR of 5.14% during this period. There is also a healthy increase of 8.17% in the availability of electricity (from 14,13,903 GWh during 2021-22 to 15,29,471 GWh) during 2022-23(P).

Fig 5.5: Trends of Net availability of Electricity in India during 2013-14 to 2022-23 (P)



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Table 5.1: Year wise Availability of Energy Resources

| Year | Coal (Million Tonnes) | Lignite (Million Tonnes) | Crude Oil (Million Tonnes) | Natural Gas (Billion Cubic Metres) |
|---|--------------------------|-----------------------------|-------------------------------|---------------------------------------|
| 2013-14 | 722.90 | 44.64 | 227.03 | 52.37 |
| 2014-15 | 829.60 | 49.58 | 226.90 | 51.30 |
| 2015-16 | 847.58 | 45.48 | 239.79 | 52.51 |
| 2016-17 | 857.64 | 47.32 | 249.94 | 55.70 |
| 2017-18 | 868.23 | 46.98 | 256.12 | 59.17 |
| 2018-19 | 958.36 | 42.69 | 260.70 | 60.79 |
| 2019-20 | 1002.17 | 41.88 | 259.12 | 64.14 |
| 2020-21 | 956.02 | 37.21 | 226.95 | 60.82 |
| 2021-22 | 945.36 | 45.89 | 242.07 | 64.14 |
| 2022-23(P) | 1145.27 | 43.18 | 261.91 | 59.95 |
| Growth rate of 2022-23 over 2021-22(%) | 21.15 | -5.92 | 8.20 | -6.54 |
| CAGR 2013-14 to 2022-23 (%) | 5.25 | -0.37 | 1.60 | 1.51 |

(P): Provisional
 Note: Availability is defined as below:
 Coal/lignite: Production + Net Imports + change in stocks
 Crude Oil: Production +Net Imports
 Natural Gas: Net Production i.e. (Gross production -Flared - Losses) + Net imports
 Sources:
 1. Ministry of Coal
 2. Ministry of Petroleum & Natural Gas
 3. Central Electricity Authority

Table 5.2: Year wise Availability of Coal and Lignite

| Year | (Million Tonnes) | | | | | | | | | |
|---|--|--------------|---------------|--|------------------------------------|--------------|----------|----------|--|------------------------------------|
| | Coal | | | | | Lignite | | | | |
| | Production (Coking + Non-coking) | Imports | Exports | Change of Vendible Stock (closing stock- Opening stock) | Availability for Consumption | Production | Imports | Exports | Change of Vendible Stock (closing stock- Opening stock) | Availability for Consumption |
| 1 | 2 | 3 | 4 | 5 | 6=2+3-4+5 | 7 | 8 | 9 | 10 | 11=7+8-9+10 |
| 2013-14 | 565.77 | 166.86 | 2.19 | -7.54 | 722.90 | 44.27 | 0.00 | 0.00 | 0.37 | 44.64 |
| 2014-15 | 609.18 | 217.78 | 1.24 | 3.88 | 829.60 | 48.27 | 0.00 | 0.00 | 1.32 | 49.58 |
| 2015-16 | 639.23 | 203.95 | 1.58 | 5.97 | 847.58 | 43.84 | 0.00 | 0.00 | 1.63 | 45.48 |
| 2016-17 | 657.87 | 190.95 | 1.77 | 10.59 | 857.64 | 45.23 | 0.02 | 0.01 | 2.07 | 47.32 |
| 2017-18 | 675.40 | 208.25 | 1.50 | -13.92 | 868.23 | 46.64 | 0.01 | 0.00 | 0.33 | 46.98 |
| 2018-19 | 728.72 | 235.35 | 1.31 | -4.40 | 958.36 | 44.28 | 0.02 | 0.08 | -1.54 | 42.69 |
| 2019-20 | 730.87 | 248.54 | 1.03 | 23.79 | 1002.17 | 42.10 | 0.05 | 0.09 | -0.18 | 41.88 |
| 2020-21 | 716.08 | 215.25 | 2.95 | 27.63 | 956.02 | 37.90 | 0.02 | 0.19 | -0.51 | 37.21 |
| 2021-22 | 778.21 | 208.63 | 1.32 | -40.16 | 945.36 | 47.49 | 0.01 | 0.02 | -1.59 | 45.89 |
| 2022-23(P) | 893.19 | 237.67 | 1.16 | 15.57 | 1145.27 | 44.99 | 0.02 | 0.00 | -1.83 | 43.18 |
| Growth rate of 2022-23 over 2021-22(%) | 14.77 | 13.92 | -11.63 | - | 21.15 | -5.27 | - | - | - | -5.92 |

(P): Provisional
 Total may not tally due to rounding off
 Source: Ministry of Coal

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Table 5.3: Year wise Availability of Crude Oil, Petroleum Products and Natural Gas.

| Year | Crude Oil (Million Tonne) | | | Petroleum Products (Million Tonne) | | | Natural Gas (Billion Cubic Meter) * | | |
|---|---------------------------|-------------|--------------|------------------------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Production | Net Imports | Availability | Production | Net Imports | Availability | Production | Net Imports | Availability |
| 1 | 2 | 3 | 4=2+3 | 5 | 6 | 7=5+6 | 8 | 9 | 10 = 8+9 |
| 2013-14 | 37.79 | 189.24 | 227.03 | 220.76 | -51.17 | 169.59 | 34.57 | 17.80 | 52.37 |
| 2014-15 | 37.46 | 189.43 | 226.90 | 221.14 | -42.63 | 178.50 | 32.69 | 18.61 | 51.30 |
| 2015-16 | 36.94 | 202.85 | 239.79 | 231.92 | -31.08 | 200.84 | 31.12 | 21.39 | 52.51 |
| 2016-17 | 36.01 | 213.93 | 249.94 | 243.55 | -29.23 | 214.32 | 30.85 | 24.85 | 55.70 |
| 2017-18 | 35.68 | 220.43 | 256.12 | 254.40 | -31.37 | 223.03 | 31.73 | 27.44 | 59.17 |
| 2018-19 | 34.20 | 226.50 | 260.70 | 262.36 | -27.75 | 234.61 | 32.05 | 28.74 | 60.79 |
| 2019-20 | 32.17 | 226.95 | 259.12 | 262.94 | -21.90 | 241.04 | 30.26 | 33.89 | 64.14 |
| 2020-21 | 30.49 | 196.46 | 226.95 | 233.51 | -13.52 | 219.99 | 27.78 | 33.03 | 60.82 |
| 2021-22 | 29.69 | 212.38 | 242.07 | 254.31 | -23.74 | 230.57 | 33.12 | 31.03 | 64.14 |
| 2022-23(P) | 29.18 | 232.73 | 261.91 | 266.54 | -16.50 | 250.04 | 33.65 | 26.30 | 59.95 |
| Growth rate of 2022-23 over 2021-22(%) | -1.72 | 9.58 | 8.20 | 4.81 | -30.50 | 8.45 | 1.61 | -15.22 | -6.54 |
| CAGR 2013-14 to 2022-23 (%) | -2.83 | 2.33 | 1.60 | 2.12 | -11.82 | 4.41 | -0.30 | 4.43 | 1.51 |

* : Availability of natural gas is equal to indigenous net production (Gross production-Flared/Losses) + net imports
(P): Provisional; Total may not tally due to rounding off.
Source: Ministry of Petroleum & Natural Gas.

Table 5.4: Year wise Availability of Electricity

(in Giga Watt hour = 10⁶ Kilo Watt hour)

| Year | Gross Electricity Generated from Utilities | Consumption in Power Station Auxiliaries | Net Electricity Generated from Utilities | Purchases from Non-Utilities + Net Import from Other Countries | Net Electricity Available for Supply |
|---|--|--|--|--|--------------------------------------|
| 1 | 2 | 3 | 4=2-3 | 5 | 6=4+5 |
| 2013-14 | 10,26,649 | 70,161 | 9,56,488 | 17,948 | 9,74,436 |
| 2014-15 | 11,16,850 | 76,268 | 10,40,582 | 13,773 | 10,54,355 |
| 2015-16 | 11,67,584 | 79,302 | 10,88,282 | 15,947 | 11,04,228 |
| 2016-17 | 12,35,358 | 81,044 | 11,54,314 | 8,977 | 11,63,290 |
| 2017-18 | 13,03,455 | 82,148 | 12,21,307 | 11,198 | 12,32,505 |
| 2018-19 | 13,71,779 | 83,386 | 12,88,393 | 19,291 | 13,07,685 |
| 2019-20 | 13,83,417 | 83,301 | 13,00,116 | 22,932 | 13,23,048 |
| 2020-21 | 13,73,187 | 80,472 | 12,92,715 | 21,310 | 13,14,025 |
| 2021-22 | 14,84,463 | 86,756 | 13,97,707 | 16,197 | 14,13,903 |
| 2022-23(P) | 16,17,813 | 1,02,919 | 15,14,894 | 14,577 | 15,29,471 |
| Growth rate of 2022-23 over 2021-22(%) | 8.98 | 18.63 | 8.38 | -10.00 | 8.17 |
| CAGR 2013-14 to 2022-23 (%) | 5.18 | 4.35 | 5.24 | -2.28 | 5.14 |

(P): Provisional

Source: Central Electricity Authority.