



IEA Report Electricity 2024

For Prelims: [International Energy Agency](#), [Coal](#), [Small Modular Reactor](#), [Organisation for Economic Cooperation and Development](#), [Renewable Energy](#)

For Mains: Coal demand, Challenges and Opportunities for emerging economies in balancing growth with renewables, Mineral & Energy Resources

Source: [DTE](#)

Why in News?

Recently, the [International Energy Agency \(IEA\)](#) unveiled key insights into India's energy future with its report "**Electricity 2024.**"

- This comprehensive analysis highlights trends, such as the persistent role of [coal](#), a surge in renewable energy, and the promising growth of nuclear power, shaping India's power sector until 2026.

What are the Key Highlights of the Electricity Report 2024?

- **Continued Reliance on Coal:**
 - **India is projected to rely on coal** to meet rising electricity demand through 2026.
 - Coal-fired generation is expected **to meet 68% of India's electricity demand by 2026**, despite a decrease from 74% in 2023.
 - **Coal-fired power generation** is expected to rise by 2.5% annually (2024-2026).
 - Despite [India's net-zero target by 2070](#), coal is expected to dominate, meeting 68% of demand.
- **Renewable Generation:**
 - [Renewable energy \(RE\)](#) generation remained relatively stable, with a 21% share of electricity generation in 2023. The rise in solar and wind was largely offset by reduced hydropower output
 - Close to 21 gigawatts (GW) of RE capacity was added during 2023, with **RE accounting for nearly 44% of total installed capacity** in 2023.
- **Electricity Demand Dynamics:**
 - India's electricity demand **rose by 7% in 2023**, driven by rapid economic growth and increased space cooling needs.
 - Expected annual **average growth of 6.5% between 2024 and 2026**.
 - India's electricity demand is projected to **outpace China's by 2026**, with the world's fastest growth rate.
- **Global Comparison and Emerging Economies:**
 - China holds the largest volume of expected growth, India's electricity demand in the three years might nearly be equivalent to the United Kingdom's.
 - Developed economies reported substantial reductions in manufacturing and industrial output, and high inflation.

- About **85% of new electricity capacity** is expected from [emerging economies](#), particularly in South Asia, with China and India in the lead.
- **Hydropower Challenges and Mandates:**
 - Changing weather patterns led to a **15% fall in hydropower generation** in 2023.
 - To ensure uninterrupted power supply, the government mandated a **blending of a minimum of 6% of imported coal** with domestic coal until March 2024.
- **Diversification Efforts:**
 - Besides adding [wind and solar power](#) capacity, **large hydro and nuclear power projects** are being developed in the country.
- **Nuclear Power Surge:**
 - More than half of the nuclear power plants in the pipeline globally (between 2024-2026) **are in China and India.**
 - IEA forecasts **global nuclear generation will be almost 10% higher in 2026**, compared to 2023.
 - India announced plans **in 2022 to triple its nuclear capacity by 2032**, aiming to add 13 GW, with 6 GW currently under construction.
 - India currently has **23 operable nuclear reactors** providing about 2% of the country's electricity.
 - Report highlighted that the **largest domestically built nuclear power plant, the 700 MWe Kakrapar Unit 3 reactor**, commenced operations in Gujarat in June 2023 and reached full capacity in August 2023.
 - Based on the country's project timeline, **Nuclear power generation is expected to increase** rapidly during 2024-2026, with new plants totalling an **estimated 4 GW of capacity entering commercial operation**".
- **Global Nuclear Landscape:**
 - According to the World Nuclear Association estimates as of November 2023, **68 GW of nuclear capacity is under construction**, 9 GW is currently planned and 353 GW is proposed.
 - **Asia is expected to surpass North America's nuclear power growth** by 2026, reaching a **30% share of global nuclear generation.**
- **Small Modular Reactor (SMR) Technology:**
 - The report highlighted that momentum is growing behind [small modular reactor \(SMR\) technology](#).
 - SMRs are advanced nuclear reactors that have a **power capacity of up to 300 MW(e) per unit**, which is about **one-third** of the generating capacity of traditional **nuclear power reactors.**
 - SMRs, which can produce a **large amount of low-carbon electricity, are:**
 - **Small:** physically a fraction of the size of a conventional nuclear power reactor.
 - **Modular:** making it possible for systems and components to be factory-assembled and transported as a unit to a location for installation.
 - **Reactors:** harnessing nuclear fission to generate heat to produce energy.
 - The SMR Technology development and deployment are progressing, but not without challenges. R&D is starting to accelerate.

Glance of India's Power Sector:

- Installed Electricity Generation Capacity (Fuelwise) as of May 2023:
 - Total Installed Capacity (Fossil Fuel & Non-Fossil Fuel) is 417 GW.
 - The share of various energy sources in the total Electricity Generation are:
 - **Fossil fuel** (including Coal)- **56.8%**
 - **Renewable Energy** (including Hydropower)- **41.4%**
 - **Nuclear fuel-** **1.60%**

India's Renewable Energy Target:

- India is set to achieve its short term and long term targets under the **Panchamrit action plan, like**
 - **Reaching a non-fossil fuel energy capacity of 500 GW by 2030.**

- Fulfilling at least half of its energy requirements via renewable energy by 2030
- **Reducing CO₂ emissions by 1 billion tons by 2030; reducing carbon intensity below 45 percent by 2030.**
- **Net-Zero emission target by 2070.**
- In August 2022, India updated its [Nationally Determined Contribution \(NDC\)](#) according to which the target to reduce emissions intensity of its [GDP](#) has been **enhanced to 45% by 2030 from 2005 level.**

What is the International Energy Agency (IEA)?

▪ About:

- The IEA was **created in 1974** by member countries of the [Organisation for Economic Co-operation and Development \(OECD\)](#) to help industrialized countries respond to **major 1973-1974 oil crisis.**
 - Since then, its work has expanded to cover energy security, economic development, and clean energy.
- The IEA is an **autonomous forum** that provides analysis, data, and policy recommendations to help countries provide secure and sustainable energy.
- The IEA has four main areas of focus: **energy security, economic development, environmental awareness and engagement worldwide.**
- Headquartered in **Paris, France.**

▪ Members:

- The IEA family is made up of 31 member countries, **13 association countries including [India](#),** and 4 accession countries.
 - A candidate country to the **IEA must be a member country of the OECD.**

▪ Major Publications:

- [World Energy Outlook reports.](#)
- [India Energy Outlook Report.](#)
- [World Energy Investment Report.](#)
- [The IEA Technology Roadmap and Policy Pathway series.](#)
- **The Annual Energy Efficiency Market Report.**
- **The Energy Technology Perspectives.**

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims:

Q1. Consider the following statements: (2019)

1. Coal sector was nationalized by the Government of India under Indira Gandhi.
2. Now, coal blocks are allocated on lottery basis.
3. Till recently, India imported coal to meet the shortages of domestic supply, but now India is self-sufficient in coal production.

Which of the statements given above is/are correct?

- (a) 1 only
 (b) 2 and 3 only
 (c) 3 only
 (d) 1, 2 and 3

Ans: (a)

Q2. Which of the following is/are the characteristic/characteristics of Indian coal? (2013)

1. High ash content
2. Low sulphur content
3. Low ash fusion temperature

Select the correct answer using the codes given below:

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (a)

Q3. Consider the following statements:

1. "The Climate Group" is an international non-profit organization that drives climate action by building large networks and runs them.
2. The International Energy Agency in partnership with the Climate Group launched a global initiative "EP100".
3. EP100 brings together leading companies committed to driving innovation in energy efficiency and increasing competitiveness while delivering on emission reduction goals.
4. Some Indian companies are members of EP100.
5. The International Energy Agency is the Secretariat to the 'Under2 Coalition'.

Which of the statements given above are correct?

- (a) 1, 2, 4 and 5
- (b) 1, 3 and 4 only
- (c) 2, 3 and 5 only
- (d) 1, 2, 3, 4 and 5

Ans: (b)

Mains

Q. "In spite of adverse environmental impact, coal mining is still inevitable for development". Discuss. (2017)