



**12th India - U.S. Track II Dialogue on Climate Change and Energy
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**STATE OF PLAY - BACKGROUND PAPER INDIA
Nationally Determined Contributions**

At COP26 in 2021, Prime Minister Narendra Modi pledged that India would:

- Raise the non-fossil fuel-based energy capacity of the country to 500 GW by 2030
- Meet 50% of the country’s energy requirements using renewable energy sources by 2030
- Reduce the total projected carbon emission by one billion tonnes between now and 2030
- Reduce the carbon intensity of the economy to less than 45% by 2030
- Become carbon neutral and achieve net zero emissions by 2070.

In August 2022, the Indian cabinet approved India’s updated NDCs. An overview:

Quantified Goals	Non-Quantified Goals
To reduce the emissions intensity of its GDP by 45 per cent by 2030, from the 2005 level.	To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for ‘LIFE’– ‘Lifestyle for Environment’ as a key to combating climate change.

<p>To achieve about 50 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of the transfer of technology and low-cost international finance including from the Green Climate Fund (GCF).</p>	<p>To adopt a climate-friendly and cleaner path than the one followed hitherto by others at the corresponding level of economic development.</p>
<p>To create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.</p>	<p>To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, the Himalayan region, coastal regions, and health and disaster management.</p>
	<p>To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.</p>
	<p>To build capacities, create a domestic framework and international architecture for quick diffusion of cutting-edge climate technology in India and joint collaborative R&D for such future technologies.</p>

Source: PIB, Government of India

At COP27 in November 2022, India submitted its Long-Term Low Emissions Development Strategy (LT-LEDS) which provides a breakdown of initiatives by sector, but these do not go beyond current policies and general future direction.¹

The salient features² of the strategy are –

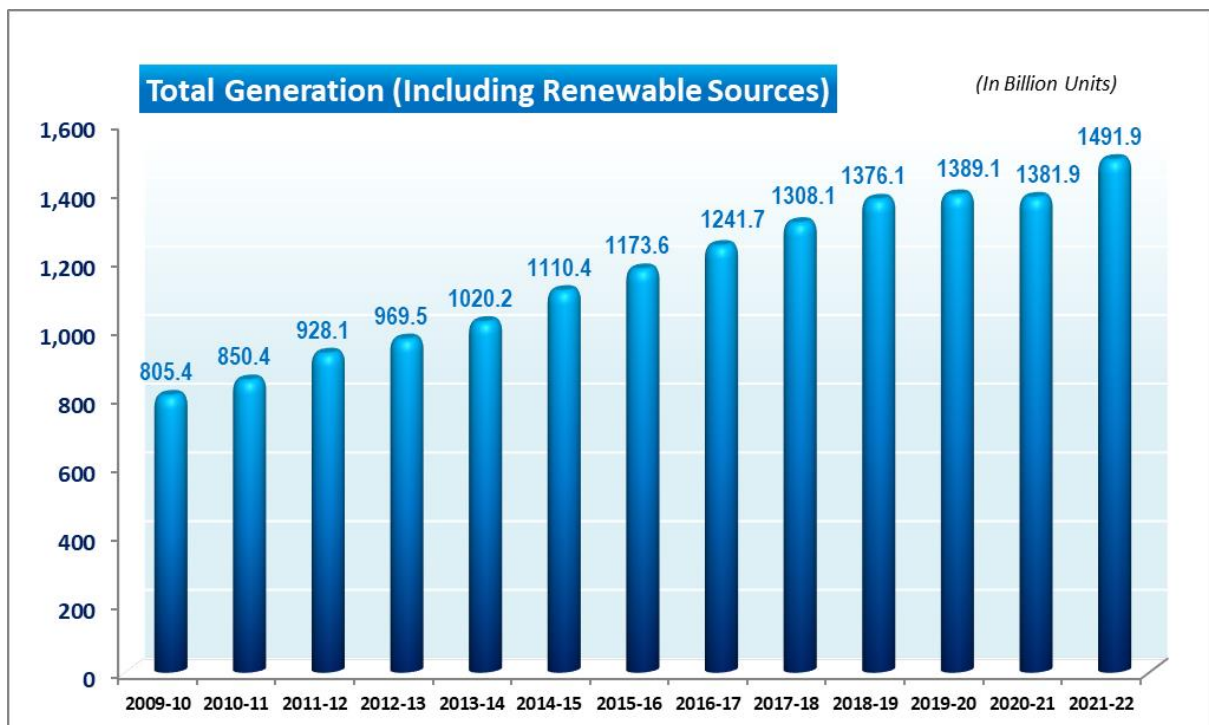
¹ The Minister of State for Environment, Forest & Climate Change, Shri Ashwini Kumar Choubey in a written reply in Rajya Sabha. <https://pib.gov.in/PressReleasePage.aspx?PRID=1881755>

² <https://pib.gov.in/PressReleasePage.aspx?PRID=1875816>

1. Rational utilization of national resources with due regard to energy security.
2. Increased use of biofuels, especially ethanol blending in petrol, the drive to increase electric vehicle penetration, and the increased use of green hydrogen fuel are expected to drive the low carbon development of the transport sector. India aspires to maximise the use of electric vehicles, ethanol blending to reach 20% by 2025, and a strong modal shift to public transport for passenger and freight.
3. Urbanization will continue as a strong trend from our current relatively low base, future sustainable and climate resilient urban development will be driven by smart city initiatives.
4. India's industrial sector will continue on a strong growth path, in the perspective of 'Atma Nirbhar Bharat' and 'Make in India'. The focus will be on improving energy efficiency by the Perform, Achieve and Trade (PAT) scheme, National Hydrogen Mission, high level of electrification in all relevant processes and activities, enhancing material efficiency and recycling leading to expansion of circular economy, and exploring options for hard-to-abate sectors, such as steel, cement, aluminum and others.
5. India is on track to fulfilling its NDC commitment of 2.5 to 3 billion tonnes of additional carbon sequestration in forest and tree cover by 2030.

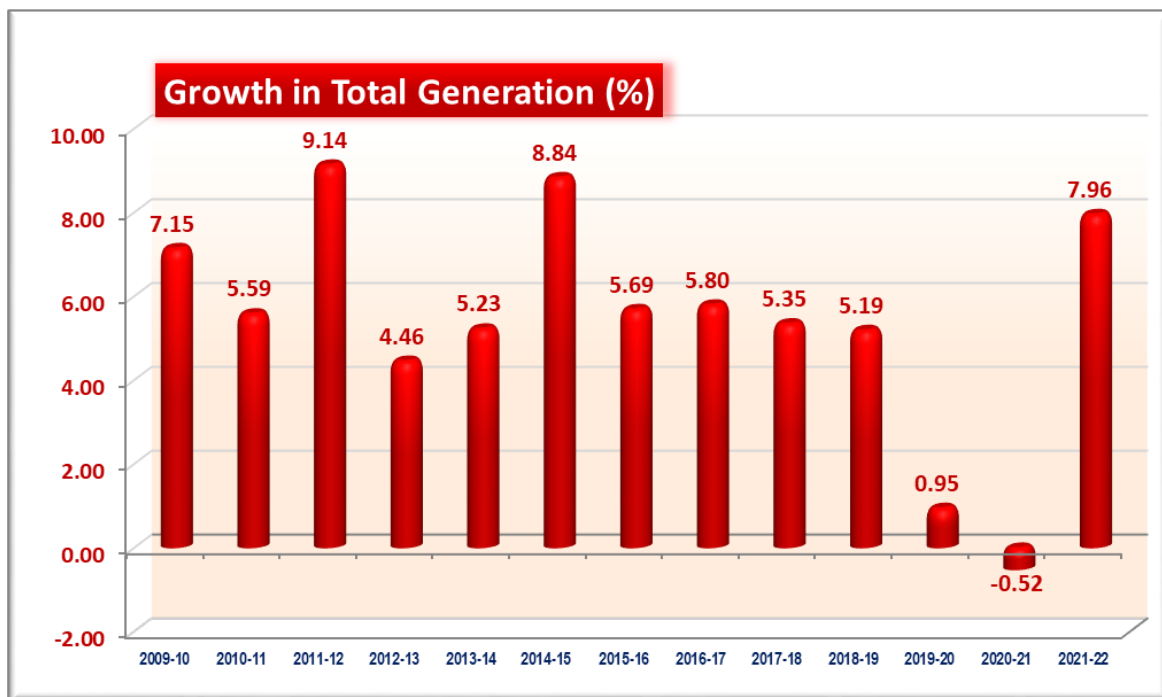
Energy Consumption, Capacity and Generation

Generation (Billion Units)



Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>

Generation Growth (%)



Source: <https://powermin.gov.in/en/content/power-sector-glance-all-india>

Coal is the most abundant fossil fuel in India. It accounts for 55% of the country's energy needs. The country's industrial heritage was built upon indigenous coal. Commercial primary energy consumption in India has grown by about 700% in the last four decades. The current per capita commercial primary energy consumption in India is about 350 kgoe/year which is well below that of developed countries. Driven by the rising population, expanding economy and a quest for improved quality of life, energy usage in India is expected to rise. Considering the limited reserve potentiality of petroleum & natural gas, eco-conservation restriction on hydel projects and geo-political perception of nuclear power, coal will continue to occupy the center-stage of India 's energy scenario³.

In Washington recently, the Finance Minister said India's move away from coal will be hampered by the war in Ukraine. At the recently concluded Budget session, the Minister of Power said, "Despite push for renewables, the country will require base load capacity of coal-based generation for stability and also for energy security."

India's total renewable energy capacity, excluding large hydro and nuclear plants, reached 122 gigawatts in February 2023, the latest monthly report by the Central Electricity Authority (CEA) showed. This was an increase of almost 15% from February 2022, but still 30% short of the 175-GW target that the central government had aimed to reach by the end of 2022.

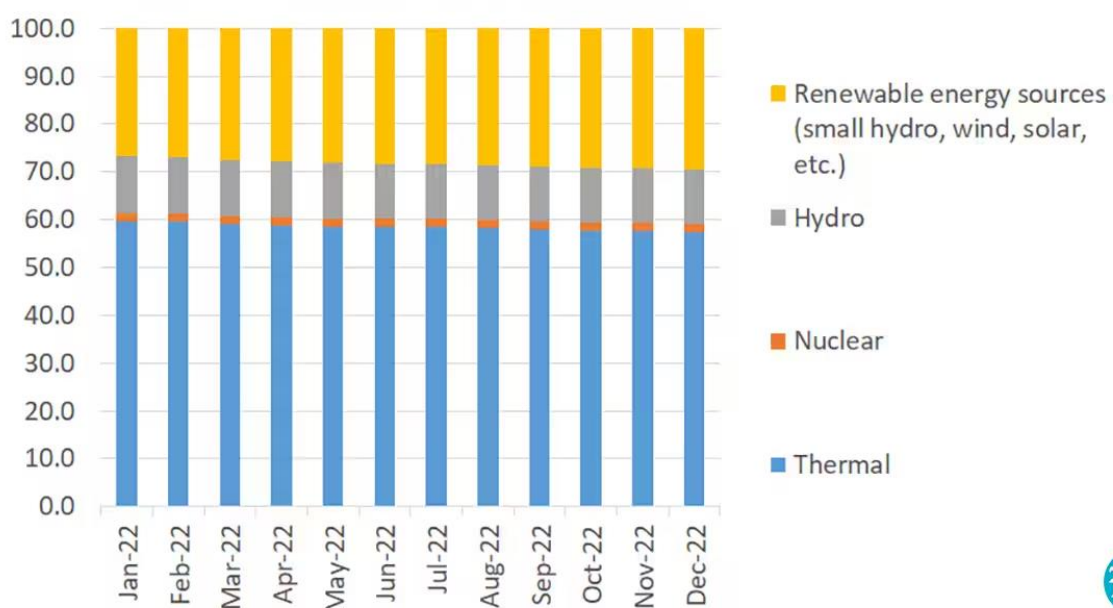
In pursuit of achieving 500 GW of installed electricity capacity from non-fossil sources by 2030, a total of 172.72 GW of capacity from non-fossil fuel sources has been installed in

³<https://coal.nic.in/en/major-statistics/coal-indian-energy-choice#:~:text=Indian%20Energy%20Choice-Coal%20%E2%80%93%20Indian%20Energy%20Choice,in%20the%20last%20four%20decades.>

the country as on 31.10.2022. This includes 119.09 GW RE, 46.85 GW Large Hydro and 6.78 GW Nuclear Power capacity. This has a share of 42.26% of total installed generation capacity in the country i.e. 408.71 GW⁴.

India stands 4th globally in Renewable Energy Installed Capacity (including Large Hydro), 4th in Wind Power capacity & 4th in Solar Power capacity (as per REN21 Renewables 2022 Global Status Report). A total of 14.21 GW of Renewable Energy (RE) capacity was added, during the period January to October 2022 as compared to capacity of 11.9 GW added during the period January to October 2021. A total of 151.94 BU have been generated from RE sources during the period January to Septuary 2022 as compared to the 128.95 BU during the period January to September 2021.

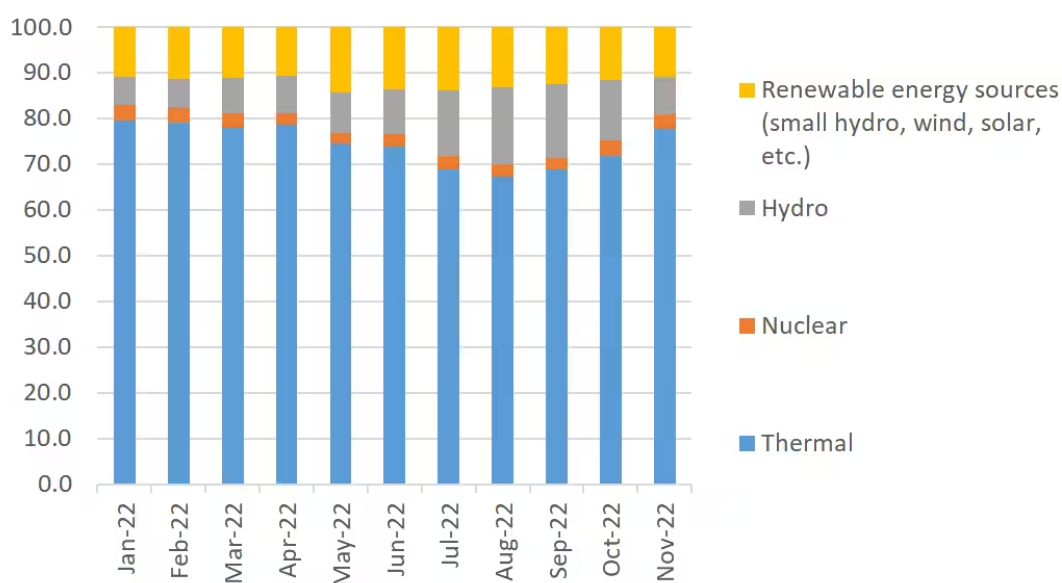
Chart 1: Share of sources in installed electricity capacity (%)



Source: <https://www.hindustantimes.com/india-news/budget-2023-35-000-crore-outlay-for-growth-in-green-energy-transition-101675305430478.html>

⁴<https://pib.gov.in/PressReleasePage.aspx?PRID=1885147#:~:text=This%20has%20a%20share%20of,Renewables%202022%20Global%20Status%20Report>

Chart 2: Share of sources in electricity generation (%)



Source: <https://www.hindustantimes.com/india-news/budget-2023-35-000-crore-outlay-for-growth-in-green-energy-transition-101675305430478.html>

Climate - Energy Legislation, Policies and Welfare Schemes in 2022 - 2023

1. India's Energy Conservation Act of 2001 underwent an [amendment in August 2022](#).⁵

Features:

- It empowers the central government to specify a carbon credit trading scheme.
- Designated consumers may be required to meet a proportion of their energy needs from non-fossil sources.
- The Energy Conservation Code for buildings will also apply to office and residential buildings with a connected load of 100 kilowatt or above.
- Energy consumption standards may be specified for vehicles and ships.

Key issues:

- Carbon credit trading aims to reduce carbon emissions, and hence, address climate change. The question is whether the Ministry of Power is the appropriate Ministry to regulate this scheme. A further question is whether the market regulator for carbon credit trading should be specified in the Act.

⁵<https://www.moneycontrol.com/news/opinion/energy-conservation-act-amended-india-net-zero-goals-9855591.html>

- The same activity may be eligible for renewable energy, energy savings, and carbon credit certificates. The Bill does not specify whether these certificates will be interchangeable.
- Designated consumers must meet certain non-fossil energy use obligations. Given the limited competition among discoms in any area, consumers may not have a choice in the energy mix.

2. Union Budget 2023

The Finance Minister listed “Green Growth” as one of the seven priorities of this year’s Budget. Some of the climate - energy provisions included in the budget were:

- INR 35,000 crore for priority capital investments towards net zero transition and energy security by the ministry of petroleum and natural gas.
- Support through viability gap funding, battery energy storage systems with capacity of 4,000 MWH and formulate a detailed framework for so-called pumped storage projects (those that facilitate storage of hydroelectric power).
- Creation of an interstate transmission system for evacuation and grid integration of 13 GW renewable energy from Ladakh with an investment of ₹20,700 crore of which ₹8,300 crore will be provided by the Centre.
- Green Credit Programme will be notified under the Environment (Protection) Act to incentivise environmentally sustainable and responsive actions by companies, individuals and local bodies, and help mobilize additional resources for such activities.
- PM PRANAM: Programme for Restoration, Awareness, Nourishment and Amelioration of Mother Earth, a scheme that will be launched to incentivise states and union territories to promote alternative fertilizers and balanced use of chemical fertilizers.
- Around 500 new ‘waste to wealth’ plants will be launched under GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) for promoting a circular economy. These will include 200 compressed biogas (CBG) plants at a total investment of ₹10,000 crore.
- MISHTI, Mangrove Initiative for Shoreline Habitats & Tangible Incomes’ which will focus on mangrove plantation along the coastline and on salt pans through convergence between Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Compensatory Afforestation funds.
- The government will promote conservation techniques of local communities through Amrit Dharohar, a scheme that will be implemented over the next three years to encourage optimal use of wetlands, and enhance biodiversity, carbon stock, eco-tourism opportunities and income generation for local communities.
- Coastal shipping will be promoted as an energy efficient mode of transport through PPP mode with viability gap funding.

3. **Equity infusion of Rs.1,500 crore in Indian Renewable Energy Development Agency Limited (IREDA)⁶**

- Employment generation of approximately 10,200 jobs/year and CO2 equivalent emission reduction of approximately 7.49 Million Tonnes CO2/year
- To lend Rs.12000 crore approximately to the RE sector, thus facilitate the debt requirement of RE of additional capacity of approximately 3500-4000 MW.
- To enhance its networth which will help it in additional RE financing, thus contributing better to the Government of India targets for RE.
- To improve the capital-to-risk weighted assets ratio (CRAR) to facilitate its lending and borrowing operations.

4. **National Bioenergy Programme**

The National Bioenergy Programme which comprises the following Sub-schemes was launched on 2.11.2022:

- Waste to Energy Programme (Programme on Energy from Urban, Industrial and Agricultural Wastes/ Residues)
- Biomass Programme (Scheme to support Manufacturing of Briquettes & Pellets and Promotion of Biomass (non-bagasse) based cogeneration in Industries)
- Biogas Programme: for promotion of family type Biogas plants

5. **Solar Parks Scheme**

To facilitate large scale grid-connected solar power projects, a scheme for “Development of Solar Parks and Ultra Mega Solar Power Projects” is under implementation with a target capacity of 40 GW capacity by March 2024.

6. **PM-KUSUM Scheme Extension**

Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahaabhiyan MNRE approved to extend the Scheme until 31.03.2026 with a few modifications. This scheme provides energy and water security, de-dieselises the farm sector and also generates additional income for farmers by producing solar power. It aims to add 30.8 GW of solar capacity with central financial support of over Rs. 34,000 Crore.

7. **National Green Hydrogen Mission’s first funding**

In the Union Budget 2023, a total outlay of Rs. 19,700 crore (\$2.3 billion) for the Green Hydrogen Mission was announced. For 2023-24, the first year of the seven-year mission, the government allocated Rs. 297 crore – the first-ever such allocation for boosting the production of green hydrogen in the country.

⁶ <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1790941>

International Climate Leadership

India has emerged as a global leader on climate and energy transition action. The Government of India has launched two global climate change response initiatives:

1. [International Solar Alliance](#): The International Solar Alliance (ISA), launched at the UNFCCC COP in Paris in 2015, aims to address issues related to climate mitigation by managing energy access, security, and transition with solar projects. The ISA now has 110 member countries with nine active programmes promoting 10 GW of off-grid and grid-connected solar projects in developing countries to promote energy access and transition.
2. [Coalition for Disaster Resilient Infrastructure](#): CDRI brings together nations, multilateral agencies and public and private partners to address issues of infrastructure resilience more systematically and comprehensively.

Both these global initiatives strive for a new model of South-South cooperation and exchange of experience and knowledge of new development paradigms as developing nations mitigate and adapt to climate change while addressing their development imperatives, like poverty alleviation, food security, and economic growth. India has also played a leadership role in various UN Summits related to climate and energy, like [the India and Sweden co-leading Industry Transition track](#), and has committed to progressively enhance climate action in various plurilateral and bilateral agreements with major countries and economic blocks like [India-U.S.](#), and [India-EU climate agreements](#).

India's G20 Presidency

The G-20 theme for India's presidency in 2023 is "Vasudhaiva Kutumbakam," or "One Earth, One Family, One Future," which highlights the importance of adopting ecologically responsible and mindful choices, both in individual lifestyles and national development. Union Minister for Environment, Forest and Climate Change, Bhupender Yadav has said that India's G20 presidency aims to bring an integrated, comprehensive and consensus driven approach to address climate change and pursue sustainable growth.

The workstreams of the G20 presidency are split into: the Sherpa Track, the Finance Track and Engagement Groups. Energy security, transition, sustainability, disaster risk reduction, climate finance and green growth feature as focus areas under various working groups of all three workstreams.

The First Sustainable Finance Working Group Meeting SFWG took place in February 2023 with the aim to develop a G20 Sustainable Finance Technical Assistance Action Plan and discuss three priority areas:

- Mobilisation of timely and adequate resources for climate finance
 - Enabling finance for the Sustainable Development Goals
 - Capacity building of the ecosystem for financing toward sustainable development
- SFWG aims to mobilise sustainable finance to help ensure global growth and stability and promote the transition towards greener, more resilient, and inclusive societies and economies.

The 2nd Energy Transitions Working Group (ETWG) meeting under India's G20 Presidency commenced in Gandhinagar on 2nd April 2023. Six priority areas are the focus of the meeting including energy transition through addressing technology gaps, low-cost financing for energy transition, energy security and diversified supply chains, energy efficiency, industrial low carbon transitions, and responsible consumption, fuels for the future, and universal access to clean energy and just, affordable, and inclusive energy transition pathways.

ESG Regulations in India

The Securities and Exchange Board of India (SEBI) introduced the requirement of ESG reporting back in 2012 and mandated that the top 100 listed companies by market capitalization file a Business Responsibility Report. This was later extended to the top 500 listed companies by market capitalisation in 2015. On 10th May 2021, the SEBI introduced a new ESG reporting structure by the name Business Responsibility and Sustainability Report (BRSR). Under BRSR, listed entities (top 1000) need to provide an overview of the entity's material ESG risks and opportunities, approach to mitigate or adapt to the risks along with financial implications of the same. BRSR was introduced with the aim of making it mandatory for the top 1000 listed companies to report their sustainability performance in order to maintain transparency with stakeholders.⁷

BRSR is a questionnaire-based reporting that is divided into 3 sections as follows:

- **Section A: General Disclosures:**
This section contains details of the listed entity; products/services; operations; employees; holding, subsidiary and associate companies (including joint ventures); CSR; transparency and disclosure compliances.
- **Section B: Management and Process Disclosures:**
It contains questions related to policy and management processes, governance, leadership and oversight.
- **Section C: Principle-Wise Performance Disclosures:**
Companies are required to report upon KPIs in alignment with the nine principles of the National Guidelines on Responsible Business Conduct (NGRBC). The section classifies KPIs into two sub-categories that companies are required to report upon: Essential Indicators (Mandatory) and Leadership Indicators (Voluntary).

While SEBI introduced the requirement of BRSR via its May 2021 circular, in order to give time to companies to adapt to the new requirements, SEBI mandated that the reporting would be on a voluntary basis for the financial year 2021-22. However, for the financial year 2022-23, BRSR is mandatory for the top 1000 listed entities.

On May 6, 2022, the Securities and Exchange Board of India (“SEBI”) constituted an ESG advisory committee (“EAC”), tasked with advising on a range of ESG-related matters. Based

⁷<https://www.mondaq.com/india/securities/1196024/sebis-esg-disclosure-requirements-business-responsibility-and-sustainability-reporting>

on the recommendations of the EAC, the SEBI has released the consultation paper on ‘ESG Disclosures, Ratings and Investing’ on February 20, 2023 (“**Consultation Paper**”), and has sought public comments on the regulatory framework for ESG disclosures, ESG ratings and ESG investing, on or prior to March 6, 2023.

[The key proposals of this consultation paper are linked here.](#)

Supply Chains and Critical Minerals

India is endowed with and produces over 85 minerals, some of the required critical mineral assets for the country’s manufacturing sectors (particularly of green technologies) are not yet ready to be mined. There are also some critical minerals of which there are no known resources within the country. India is not equipped to meet its green technology requirements through domestic mining alone. Imports of minerals for domestic manufacturing or imports of the final product (embedded in these minerals) will be needed to meet its policy agenda on climate change mitigation. Currently in India, a joint venture of three Central Public Sector Enterprises, Khanij Bidesh India Ltd. (KABIL), is taking charge of ensuring mineral security through facilitating supply chains, mine asset acquisitions, and G2G collaborations.

A notable achievement of KABIL was the signing of an MoU between the Indian and Australian governments for co-operation in the field of mining and processing of critical minerals. However, much more must be done to secure India’s global mineral supply chains, including the private sector involvement.

Clean technologies will require critical minerals in varying proportions. The approximate material intensities have been sourced from the relevant literature (Ashby, Attwood, & Lord, 2012). This table shows critical Minerals Used in Green Technologies against India’s geological potential for each.

Mineral	Clean Technology Uses	India's Geological Potential	Top Three Global Extractors
Chromium	Stainless steel alloys (wind turbines)	Yes	South Africa, Turkey, Kazakhstan
Cobalt	Steel alloys, batteries, pigment	Yes	DR Congo, China, Canada
Graphite	Electrical conductors	Yes	China, India, Brazil
Indium	Photovoltaic cells, display technology	None	China, South Korea, Japan
Lithium	Batteries	None	Australia, China, Chile
Manganese	Steel and aluminium alloys	Yes	South Africa, China, Australia
Molybdenum	Steel alloys	Yes	China, Chile, United States
Nickel	Stainless steel alloys	Yes	Indonesia, Philippines, Russia
Rare earth elements	Batteries, electronics, magnets	Some	China, United States, Myanmar
Silicon	Electronics, infrastructure	Yes	China, Russia, Norway

Sources: (Indian Bureau of Mines, 2015) and (U.S. Geological Survey, 2021)

There will be an increase in the demand for several critical minerals as India transitions towards renewable power generation and electric vehicles. The move to renewable energy will require increasing quantities of various minerals, including copper, manganese, zinc, and indium. Likewise, the move to electric vehicles will require increasing quantities of various minerals, including copper, lithium, cobalt, and rare earth elements. However, India does not have reserves of nickel, cobalt, molybdenum, rare earths, neodymium and indium, and the needs for copper and silver are higher than India's current reserves. Niobium, lithium, and strontium have relatively high economic importance, adjusted by their substitutability possibilities and GVA multipliers⁸. Additionally, most minerals have some degree of substitutability, except for niobium and silver, for which no good substitutes have been found. The supply risk is relatively high for yttrium and scandium (heavy rare earths), followed by niobium and silicon. However, India does not have the recycling capacity for most minerals except aluminum, copper and steel.

Additional reading on the subject:

1. [Critical Minerals for India: Assessing their Criticality and Projecting their Needs for Green Technologies. September 2022. CSEP](#)
2. [Building Resilient Mineral Supply Chains for Energy Security. October 2022. CEEW](#)
3. [Addressing Vulnerabilities in the Supply Chain of Critical Minerals. April 2023. CEEW.](#)

This report was tabled at the recent G20 Energy Transition Working Group meeting.

⁸ https://csep.org/wp-content/uploads/2022/09/Critical-Minerals-for-Green-Technologies_26-Aug-22.pdf