

Country Report - India



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(India)**

COUNTRY PROFILE: INDIA

- Democratic Republic + Parliamentary system of Government & Union of states with 29 States & 8 UTs
- 7th largest country in the world (Area: 3,287,263 sq km) & 7,516.6 km Coastline
- 2nd most populous country in the world (Population: 1.42 billion in 2023)
- Neighbor: Afghanistan & Pakistan (NW); China, Bhutan & Nepal (N); Myanmar & Bangladesh (E) & Sri Lanka.
- Nominal GDP in FY 2022-23 is estimated to attain a level of Rs 272.41 lakh crore (USD 3.3 tr) (7 tr by 2030).
- Growth in real GDP for FY 2022-23 is 7.2 % & expected growth rate for FY24 (6-6.8 %).
- Centre's Capex increased from a long-term average of 1.7% of GDP to 2.5% of GDP in FY22 PA.
- Fiscal deficit is 6.4 % of GDP (Gross Market Borrowings are estimated at Rs 15.4 lakh cr).
- Forex Reserves 6th largest of the world (US\$ 563 bn [December 2022]) covering 9.3 mts of imports.
- The per capita income in 2022-23 is estimated at Rs 1.97 lakh (approx. \$2300)

Estimated Reserves (As on 01.04.23)

Coal (in Million Tonnes)	361408.85
Crude Oil (Million Tonnes)	651.77
Natural Gas (Billion Cubic Meters)	1138.67

Estimated Potential of Renewable Power in India during 2021-22 (in MW)

Wind Power @ 120m	Small Hydro Power	Biomass Power	Waste to Energy*	Solar Energy	Total
695509	21133.62	17538	2556	748990	1490727

ORGANIZATIONAL STRUCTURE RELATED TO ENERGY

At GoI Level, no single ministry is in charge of energy at federal/union level. However, these ministries are responsible for energy issues

- **M/o Power** governs the electricity sector in India & evolving general policy in the field of energy
 - ✓ *SB: Bureau of Energy Efficiency (BEE), CERC & SERC, CEA & NLDC (PFC, REC, NTPC NHPC, NEEPCO & POWERGRID).*
- **M/o Petroleum and Natural Gas** is responsible for exploration & production of Oil & Natural Gas, refining, distribution and marketing, import, export and conservation of petroleum products
 - ✓ *PNGRB & DGH (Oil and Natural Gas Corporation (ONGC), Indian Oil Corporation Limited (IOCL), and GAIL)*
- **M/o New and Renewable Energy** is to develop & deploy renewable energy to supplement the energy requirements
 - ✓ *National Institute of Solar Energy, National Institute of Wind Energy (IREDA, SECI)*
- **M/o Coal** determining policies & strategies for exploration and development of coal and lignite reserves.
 - ✓ *Coal Controller Organization (Coal India Limited & Neyveli lignite Corporation India Limited)*
- **D/o Atomic Energy** (nuclear power technology and other radiation technologies)
 - ✓ *6 Research Centres, 3 Industrial Organizations and 5 Public Sector Undertakings*
- **NITI Aayog** provide top-quality policy support to all stakeholders to make India energy-secure & aims to boost investment to achieve an efficient, sustainable, and clean energy system.
- **M/o Finance** with responsibility for supporting the development & implementation of energy policies through financing and funding & act as a nodal agency for external financing and funding.
- **Ministry of Statistics and Programme Implementation** - collecting and disseminating a broad range of statistics.

ENERGY SUPPLY, DEMAND & ELECTRICITY GENERATION

(in ktoe)	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
Primary Energy Supply (By Source)										
Production	3,53,332	3,54,446	3,70,637	3,79,050	3,84,064	3,86,280	4,08,621	4,08,191	3,92,909	4,26,093
Imports	2,96,176	3,10,144	3,42,222	3,62,859	3,77,569	3,95,212	4,15,111	4,37,708	3,90,614	4,03,964
Exports	-62,180	-71,507	-67,426	-64,456	-70,018	-71,201	-65,134	-70,027	-61,939	-67,010
Stock changes	-6,274	-4,481	2,742	3,836	7,159	-7,997	-2,900	13,759	11,521	-23,662
Total	5,81,054	5,88,601	6,48,175	6,81,289	6,98,774	7,02,295	7,55,699	7,89,631	7,33,105	7,39,385
Final Energy Consumption (By Sector)										
Industry	2,06,924	2,19,282	2,42,418	2,47,256	2,44,448	2,56,522	2,84,349	2,76,455	2,64,137	2,65,948
Transport	35,187	35,133	38,493	43,392	47,892	52,975	57,067	59,947	48,537	57,216
Residential	38,422	40,426	43,685	46,555	48,487	50,124	52,544	54,780	58,413	58,817
Commercial & Public	6,297	6,492	6,801	7,463	7,801	8,159	8,544	9,206	7,546	9,308
Agriculture/forestry	13,567	13,836	15,347	15,780	17,294	18,014	19,312	19,107	19,915	20,505
Non-specified (Other)	78,527	81,691	81,249	87,430	89,587	94,649	96,241	95,315	88,269	93,492
Total	3,78,925	3,96,859	4,27,994	4,47,875	4,55,510	4,80,444	5,18,057	5,14,810	4,86,817	5,05,287
Electricity Generation										
Hydro	1,13,720	1,34,847	1,29,244	1,21,377	1,22,378	1,26,123	1,34,894	1,55,769	1,50,300	1,51,627
Thermal	7,60,454	7,92,054	8,77,941	9,43,013	9,93,516	10,37,146	10,72,314	10,42,838	10,32,611	11,14,790
Nuclear	32,866	34,228	36,102	37,413	37,916	38,346	37,813	46,472	43,029	47,112
RES	57,449	65,520	61,785	65,781	81,548	1,01,839	1,26,759	1,38,337	1,47,248	1,70,912
Total	9,64,489	10,26,649	11,05,072	11,67,584	12,35,358	13,03,455	13,71,779	13,83,417	13,73,187	14,84,442

SOURCE WISE ENERGY SUPPLY (PES) & DEMAND (FEC)

(in ktoe)		Coal	Crude Oil	Oil Products	Natural Gas	Nuclear	Hydro	Solar, Wind, Others	Electricity	Total
FY 12-13	Total PES	3,20,112	2,27,553	-44,080	53,623	8,565	9,790	5,091	399	5,81,054
	FEC	1,42,366	0	1,58,636	23,889	0	0	0	70,890	3,95,782
FY 13-14	Total PES	3,34,225	2,32,021	-53,254	48,943	8,920	11,608	5,798	339	5,88,601
	FEC	1,54,516	0	1,60,065	24,158	0	0	0	75,182	4,13,921
FY 14-15	Total PES	3,86,395	2,31,887	-45,323	48,075	9,408	11,127	6,555	49	6,48,175
	FEC	1,72,407	0	1,67,129	23,657	0	0	0	81,573	4,44,767
FY 15-16	Total PES	3,95,433	2,45,067	-34,590	49,339	9,750	10,448	5,833	8	6,81,289
	FEC	1,68,885	0	1,86,117	25,547	0	0	0	86,102	4,66,651
FY 16-17	Total PES	3,97,437	2,55,439	-33,833	52,198	9,881	10,537	7,209	-94	6,98,774
	FEC	1,59,981	0	1,95,475	27,634	0	0	0	91,262	4,74,352
FY 17-18	Total PES	3,91,294	2,61,751	-35,647	55,273	9,993	10,856	8,958	-183	7,02,295
	FEC	1,66,397	0	2,07,252	28,556	0	0	0	96,615	4,98,820
FY 18-19	Total PES	4,30,630	2,66,436	-30,388	56,676	9,854	11,624	11,217	-350	7,55,699
	FEC	1,87,449	0	2,15,606	28,879	0	0	0	1,04,058	5,35,991
FY 19-20	Total PES	4,52,693	2,64,825	-25,449	59,856	12,111	13,426	12,440	-270	7,89,631
	FEC	1,78,656	0	2,16,706	30,740	0	0	0	1,07,335	5,33,438
FY 20-21	Total PES	4,22,811	2,31,947	-16,174	57,076	11,214	12,955	13,279	-2	7,33,105
	FEC	1,72,818	0	1,97,748	30,341	0	0	0	1,05,798	5,06,704
FY 21-22	Total PES	4,15,032	2,46,987	-23,209	59,939	12,278	13,070	15,429	-141	7,39,386
	FEC	1,72,115	0	2,08,077	34,033	0	0	0	1,11,482	5,25,708

EVALUATION OF IMPACT OF COVID-19

MoSPI in its report on Energy Statistics Of India-2023 had mentioned that

- During FY 2021-22, India has experienced slow rate of consumption, where all the sectors has negative growth rate.
- During FY:2020-21, consumption of Petroleum products has been decreased by 9.26% and stood at 194.30 MTs.
- Coal production during FY 2020-21 was 716.08 mt vis-a-vis 730.87 mts during 2019-20 (-2.02%)
- Imports of crude oil reduced from 226.95 MTs (2019-20) to 196.46 MTs (2019-20) (-13%)
- Total availability of crude oil experienced a downfall of 32.17 MT during FY:2020- 21 (-12%)



CO2 EMISSIONS (in MtCO2)

Source						Sector					
FY	Coal	Oil	Natural gas	Other	Total	Industry	Transport	Residential	Commercial and public services	Agriculture	Total
2013	1345	455	60	1	1861	469	226	78	21	31	825
2014	1486	480	60	1	2027	501	236	82	22	31	872
2015	1446	525	63	1	2035	503	258	84	24	31	900
2016	1438	557	72	1	2068	524	269	86	26	31	936
2017	1517	586	81	1	2185	555	291	86	28	33	993
2018	1645	589	81	1	2316	565	305	89	30	34	1023
2019	1597	593	86	1	2277	549	308	91	33	34	1015
2020	1464	531	78	2	2075	501	270	94	30	31	926

INDIA'S CURRENT ENERGY POLICY & MEASURES

- Draft National Energy Policy (2012) aimed to achieve these four key objectives of the new energy policy are
 - ✓ Access at affordable prices,
 - ✓ Improved energy security and independence,
 - ✓ Greater sustainability
 - ✓ Economic growth
- At the UNFCCC-COP 26, GoI updated its climate commitments that India will take its non-fossil energy capacity to 500 GW by 2030, 50% of its energy requirements from renewable energy by 2030, reduce the total projected carbon emissions by one billion tonnes from now onwards till 2030, will reduce the carbon intensity of its economy by > 45% By 2030 & by the year 2070, India will achieve the target of Net Zero.
- India's updated NDC will be implemented through various initiatives of the Government, such as
 - Tax concessions/Incentives such as PLI scheme for manufacturing and adoption of renewable energy
 - Promotion of clean energy industries in automotives, manufacturing of low emissions products like EV and super-efficient appliances, and innovative technologies such as green hydrogen, etc..
 - Schemes/programs to scale up India's actions on both adaptation & mitigation and measures including water, agriculture, forest, energy, sustainable mobility and housing, waste management, circular economy and resource efficiency, etc.

MAJOR CHALLENGES BEING FACED IN INDIAN ENERGY POLICIES

- **Lack of private investment:** Significant investment is required in generation and energy infrastructure in India. Many players in Indian energy sector do not have adequate financial capacity to undertake large scale investments in the energy projects.
- **Limited Energy Resources:** The fossil fuel resources available such as coal, oil etc. are limited and we are dependent of the import of oil to meet growing energy demands. This makes India vulnerable to geopolitical risks and subsequent price fluctuations. India's crude oil import dependency is around 85% in 2022-23.
- **Pricing power and issues:** Due to its implications and impact on millions of Indians, energy prices are regulated, supervised and set up in timely manner.
- **Poor Energy Infrastructure:** The critical energy infrastructure such transmission and distribution is a significant challenge to a robust Energy sector in India. The lack of efficient storage systems are also contributing to the quality of the power availability.
- **Environment and sustainability issues:** Coal, oil & gas in energy mix & its energy infrastructure disruption by climate events lead to vulnerability in Climate change.

EXPECTED LEARNINGS FROM THE COURSE

- Capacity building to have a theoretical/practical understanding of how energy policies are designed/implemented in light of climate change scenario in present world.
- To take leadership role in the energy planning and project development functions
- Approaches/Strategies taken across the world to enhance the effectiveness of energy sector planning will be critical input for energy policies in India as well.
- A comprehensive energy policy with an integrated plan with an objective of achieving carbon neutrality by having Net Zero Emissions by 2070 is imperative for India.
- Govt is working towards providing long-term or concessional resources and promote private-sector involvement, in keeping with the ambition to significantly reduce the carbon intensity of the economy.

Thank you