



Indian Coal Sector Future Outlook

Implication of coal block auction in power
generation

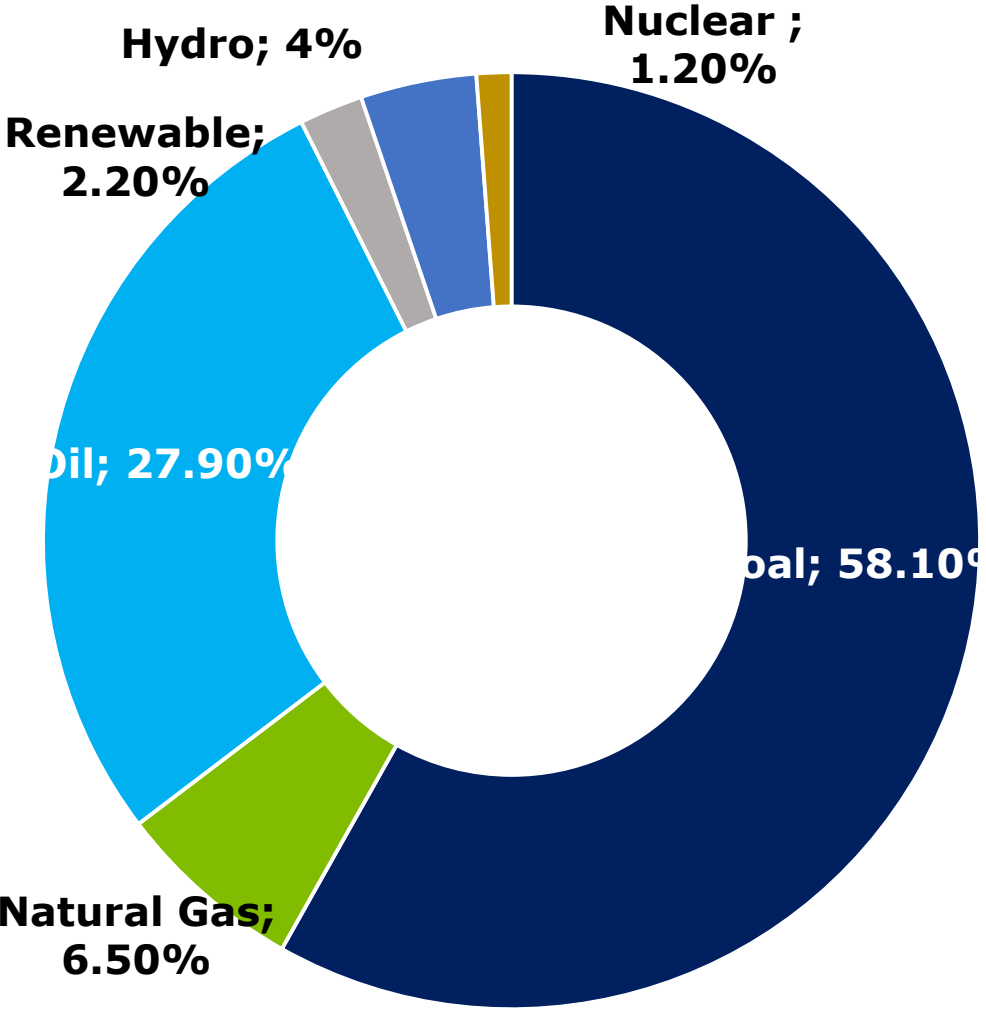
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Current Scenario



Source: BP Statistics (2016)

Coal plays a dominant role in India's energy sector.

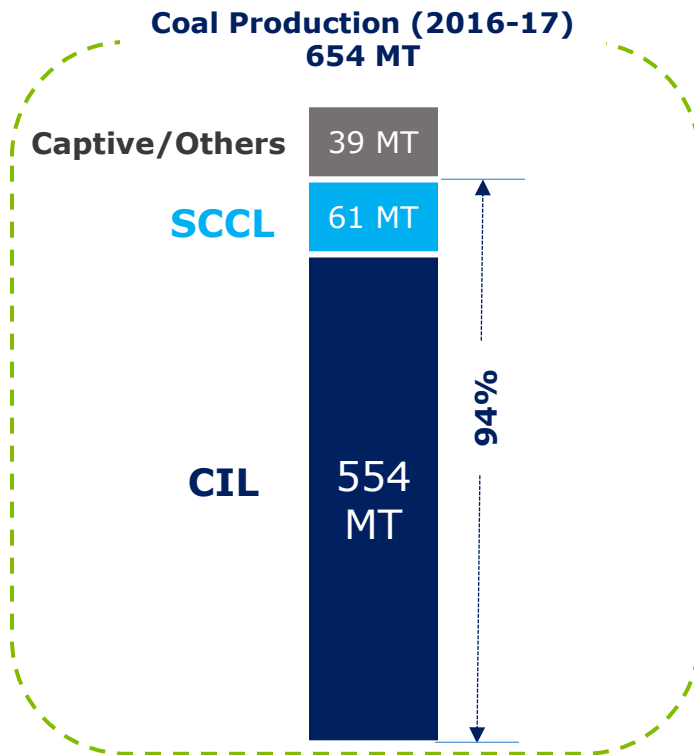
It is one of the cheapest sources of energy

Coal accounts for >58% of India energy needs.

Domestic Coal Sourcing-Existing arrangement

90% of coal is produced and supplied by Coal India and Singareni Collieries creating a monopolistic scenario

In-efficient coal linkage in terms of location of sourcing mines & end-use plants adversely impacting cost of power generation



- Monopolistic control of CIL and SCCL; impacting optimization of coal supply cost.
- Consistency Issue: Declared Versus Supplied grade of coal
- Private players can own mines for captive purpose
- Poorly planned logistics of coal supply – single biggest reason of unprofitably high landed cost of coal

Logistics comprise ~50% of GSECL's coal cost: (Financial Express, Aug 8, 2017)

In an attempt to cut power purchase cost, Gujarat has invited tenders to buy coal-based electricity from independent power producers who would agree to sell power at less than Rs 2.82/unit. Through the auction, Gujarat will transfer the coal allocated to power generating stations owned by GSECL to more fuel efficient pvt power plants.

If the power plant which wins the tender is located near the colliery itself, then the state can save on coal transportation costs as well. The average landed cost of coal for the seven coal-based power units of GSECL is about Rs 4,812 per metric tonne, **of which half is accounted as transportation cost.**

Power plants can save Rs 6,000 crore by coal linkage swap (The Times of India, Feb 7, 2015)

The government task force, comprising senior officers of different ministries, has recommended implementation of the reshuffling plan be put in place. Once covered, as much as Rs6,000 crore is expected to be saved on transportation costs each year.

Unfolding Scenario

Invigorated thrust by Government of India has provided an impetus to renewable power generation (especially Solar), which may play a disruptive role to thermal power projects. Thermal power projects is facing a threat of becoming uncompetitive vis-à-vis solar power

STRICTER ENVIRONMENTAL NORMS/COMMITMENTS

- India in its INDC has committed reduction of emission intensity of its GDP by 33 – 35% by 2030 from 2005 level to combat climate change
 - Aiming to achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 (175 GW RE Capacity by 2022)

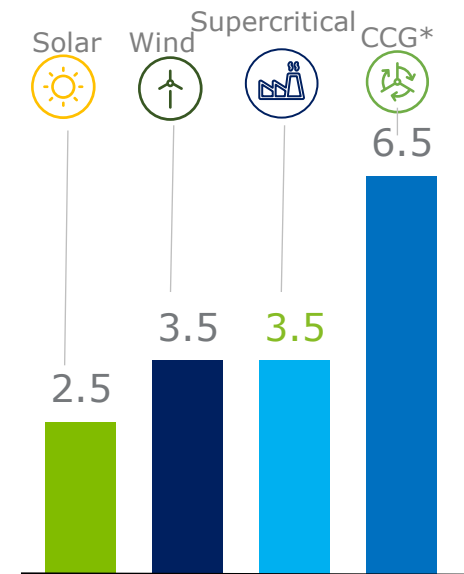
OTHER CHALLENGES TO VIABILITY OF THERMAL POWER PLANTS

- Stricter Environmental norms increasing cost of compliances
- Aging sub-critical power plants are inefficient
- Ever reducing solar power cost threatening competitiveness of thermal coal power plants

RENEWABLE STILL IS IN EARLY STAGE

- Renewable power is not a base load, it is time-of-day sensitive and cannot be stored (at this moment). Hence more ephemeral than thermal electricity.
- Grid integration & management is still a major area to achieve which would require time and money

Levelized cost of energy generation in India (INR/KWH)



*Combined Cycle Gas turbine
Source: Bloomberg

Solar power is still in initial stage and will take time to mature. A matured solar system will require large scale availability of storage technologies and modern grid system. Hence coal based power plants is expected to grow; however it requires optimization in operational practices.

Future Scenario

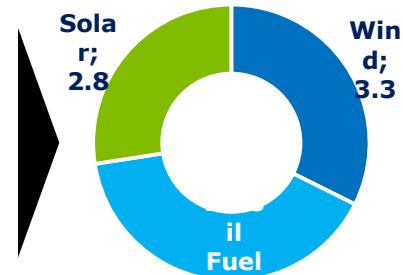
As per the recent joint report (Energizing India) of NITI Aayog and IEEJ, Japan - Coal will contribute 42% of total energy supply in 2047 (ambitious scenario). Coal based power stations will increase from 125 GW to 459 GW (ambitious scenario).

Electricity Demand

Sector	2012	2047	
		BAU	Ambitious
TWh		BAU	Ambitious
Buildings	240	3016	2472
Industry	336	1692	1891
Transport	79	296	275
Pumps & Tractors	136	501	353
Others	14	145	153
Total	805	5651	5144

Investment in power generation capacity by 2040 (\$ trillion)

Source: Bloomberg



Electricity Supply- Installed Capacity

Sector	2012	2047	
		BAU	Ambitious
GW		BAU	Ambitious
Gas Power Stns	24	50	83
Coal Power Stns	125 →	333	459
Carbon Capture (CCS)	0	35	80
Nuclear	5	26	45
Hydro	41	75	105
Solar PV+CSP	1	396	477
Wind	17	233	292
Small Hydro	3	20	30
Distributed solar PV	0	191	216
Biomass	5	11	23
Waste to Electricity	0	6	6
Total	221	1375	1816

Way Ahead – Coal Sector



1 >

Logistical Rationalization

Sourcing coal from nearest possible coal mines



2 >

Planning of Pit Head Power Plants

Coal India, SCCL and captive miners are suggested to have pit head plants; will substantially reduce power generation cost



3 >

Bringing Competition in Coal Mining

Commercial mining is expected to bring process optimization and inculcation of modern practices leading to reducing cost of mining



4 >

Thrust on clean coal technologies

Focussing on modern practices in UCG, CTL and CBM will help in reducing dependence on import for crude oil & natural gas. This will reduce carbon footprint too