India - Country Perspective

on the Coal market and down the Value Chain.

By
N.N.Gautam
Advisor, UNDP/GEF-GOI CBM Project
Former Advisor, Ministry of Coal

South Asia Regional Initiative/Energy (SARI/E)
Regional Clean Coal Partnership Program (RCCP)
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INDIA'S GROWING ENERGY CONSUMPTION IN GLOBAL SCENARIO

(FIG. IN MTOE)

ENERGY TYPE (CONSUMPTION)	WORLD		INDIA	
	2003	2030	2003	2030
OIL	3639-43 %	5775-42%	119- 37%	435 - 29%
NATURAL GAS	2243-26%	4125-30%	29 - 9%	224 - 15%
COAL	2581-31%	3597-26%	167 - 53%	816 - 55%
TOTAL	8463	13497	315	1475

SOURCE: INTERNATIONAL ENERGY AGENCY(IEA)-2005

The Hydrocarbon Vision – 2025 lays down a frame work which could guide the policies of the Hydrocarbon sector for the next 20 years.

The following table reveals the perspective planning of fuel options.

Hydrocarbon Vision 2025. **(All figures in percentages)**

Year	Coal	Oil	Gas	Hydro	Nuclear
1997-98	55	31	7	2	1
2001-02	50	32	15	2	1
2006-08	50	32	15	2	1
2010-11	53	30	14	2	1
2024-25	50	25	20	2	3

PROJECTION OF TOTAL ENERGY REQUIREMENTS

YEAR	POPULATION (MILLION)	GDP (RS. IN CRS.)	TPER (MTOE)* 8%
EXISTING VALUES OF GDP IN REAL TERMS			
2003-04		22,08,196	
2004-05		23,93,671 (GROWTH:7.5%)	
2005-06 (PROV.)		2588587 (GROWTH:8.1%)	
ESTIMATED GDP BASED ON 2005-06 PRICES AND GROWTH : 8%			
2006-07	1114	27,95,674	381
2011-12	1197	41,07,762	508
2016-17	1275	60,35,650	684
2021-22	1347	88,68,351	901
2026-27	1411	130,30,517	1234
2031-32	1468	191,46,104	1633

TPER: TOTAL PRIMARY ENERY REQUIREMENT;

CONVERSION FACTOR:1MT OF COAL = 0.41 MTOE)

REQUIREMENT OF COAL, OIL, NATURAL GAS(NG) FOR POWER & NON-POWER USE

(GENERATION IN BKWH)

YEAR	TOTAL ELECT GENR ERATI ON	HYD RO	NUCL EAR	WI ND	THER MAL	COAL(MMT)		OIL (MMT)		NG(MMT)	
						POWER	NON-POWER	POWER	NON-POWER	POWER	NON-POWER
03-04	633	75	18	3	537	318	91	6	113	13	13
06-07	761	100	26	5	630	375	123	6	119	18	15
11-12	1097	179	59	8	851	493	164	8	149	25	22
16-17	1524	226	110	12	1176	656	221	9	192	41	28
21-22	1983	283	206	15	1479	814	299	12	247	58	41
26-27	2866	400	301	19	2146	1133	408	14	320	89	53
31-32	3880	500	441	24	2915	1478	562	17	418	134	73

GROWTH ASSUMPTION: 8% ; SOURCE: DRAFT INTEGRATED ENERGY POLICY(IEP-2005)

COAL:

RESERVES: (Up to 1200Mtrs. - As on 1.4.2008 per GSI)

PROVED:	**42,000 MTOE - 102 BT**
INDICATED:	**50,000 MTOE - 124 BT**
INFERED:	**15,500 MTOE - 38 BT**
TOTAL	**107,500 MTOE - 264 BT**
EXTRACTABLE (Coal):	**12500 MTOE - 30 BT (Appx.)**
EXTRACTABLE LIGNITE:	**1200 MTOE - 3 BT of 39BT**

RESERVE TO SURVIVE WITH PRESENT RATE OF EXTRACTION (EXTRACTABLE RESERVE ONLY): 75 YEARS

EXISTING POWER GENERATION CAPACITY (FROM COAL) : 64,000 MW

ESTIMATED GENERATION CAPACITY DURING 2031-32
FROM ALL SOURCES : 7,89,000 MW COAL - 4,20,000 MW

ESTIMATED REQUIREMENT DURING 2031-32 (OF COAL) : 600 MTOE TO 1200 MTOE DEPENDING ON AVAILABILITY OF OTHER FUELS

SUPPORTING OPTIONS FROM COAL:
COAL BED METHANE
UG GASSIFICATION
COAL TO LIQUID

Coal Production Year 2007-08

All figures in Mil. T

	Coking	Non Coking	Total	Source	Open cast	Under ground	Total
All India	35	421.5	456.5	CIL	335	43.5	378.5
				SCCL	28.5	12.5	41
				Others	34.5	2.5	37
Import	21.5	28.5	50	Total	398	58.5	456.5

Coal consumption Year 2007-08

Power		Steel		Cement	Cokery	Fertlizer	Sp.Iron	Others	Total
Utility	Captiv.	Dir.feed	Washd						
321	29	18	15	15	0.5	2.5	21	46	468

All India Coal Demand and Supply

As per Coal Vision 2025

Demand (@ 8% GDP)		Figs in Mts.
Items of Vision	**(2004-05)**	**Projections (2024-25)**
Metallurgical Coal	36.62	105.00
Thermal Coal	380.20	1162.00
Total Coal	414.82	1267.00
Production/Supply		
Metallurgical Coal	18.07	49.00
Thermal Coal	361.27	1037.00
Total Coal	379.34	1086.00
Gaps		
Metallurgical Coal	16.55	56.00
Thermal Coal	18.93	125.00
Total Gap	35.48	181.00
Coal Equivalent from		
Production abroad	-	10.00*
CBM/CMM/ Coal to oil	-	15.00*

Plan	Demand	Prod CIL	Prod S CCL	Prod Others	total	Gap
XI	731	520	41	119	680	51
XII	1125	664	45	246	1055	70

Captive Mining: Return of Private sector

- Under the Coal Mines (Nationalisation) Act,1973 coal mining is exclusively reserved for the public sector, with two exceptions viz.(i) captive mining by private companies engaged in production of iron and steel and (ii) sub-lease for coal mining to private parties in isolated small pockets not amenable to economic development and not requiring rail transport, were allowed.

- Considering the need to augment power generation, 1993 the Government decided to allow private participation in captive coal mining for generation of power, for washing of coal obtained from a mine and production of cement in addition to the existing provision for the captive coal production of iron and steel.

Current status of Captive Coal Block Allocation

- 182 coal blocks with nearly 45 bt coal reserves are allocated for captive mining.

- The growth of production from new captive coal mines is slower than expected.

- Captive coal contribution in year 2007-08 is only 21 mt in total production of 456 Mt

Non Conventional Energy sources

Coal Bed Methane

- ✓Methane is a powerful green house gas,(GHG), 21 times more potent than CO2 but is a remarkable clean fuel
- ✓ MOP&NG in consultation with MOC has called for three global biddings date, allocating 26 CBM blocks in this group.
  - ➢ 1st. Bidding : 5 Blocks allocated- ONGC 2 ; Reliance 2; ESSAR 1
  - ➢ 2nd. Bidding: 8 Blocks Bid and allocated- ONGC 5; Reliance 3
    2 blocks on nomination basis have been allotted to ONGC-CIL Joint venture and one to GEECL
  - ➢ 3rd. Bidding: 10 blocks- 54 offers received- 3 ARROW/GAIL, 4 Reliance consortium, 2 Coal Gas Mart Consortium , 1 BP Exploration
  - ➢ 4th bidding for CBM blocks is expected to come shortly
  - ❑ Area Allocated: 13600 sq. Km, having 1374 BCM CBM resources
  - ❑ CBM Prod. Potential: 38 MMSCMD, Current Prod. 1 Lac SCMD
  - ❑ Coreholes Drilled: 140- Test wells Drilled: 77- Investment made: 400 Crs.

Coal Mine Methane

- ✓ It is necessary to capture methane in advance of mining and is not to be released in the atmosphere during Mining.
- ✓ UNDP/GEF-GoI " CBM Recovery and Commercial utilisation" project costing 92 crs. under implementation at BCCL.
- ✓ CMM recovery has started and is being utilised in power generation (2 X 250 KW) at Moonidih, BCCL, Dhanbad, Jharkhand

Underground Coal Gassification (UGC)

UCG IS A PROCESS BY WHICH COAL IS CONVERTED IN SITU TO COMBUSTIBLE GAS THAT CAN BE USED AS FUEL OR CHEMICAL FEED STOCK. Proposed sites for UGC

Location	Developing Agency
Kasta Raniganj CF	ONGC & CIL Jt. venture.
Godavari C F	SCCL & ONGC
Rajasthan Lignite	NLC & ONGC
Gujarat Lignite	GIPCL & ONGC
Lignite in other areas	Reliance Industries with GMDC

Coal To liquid (CTL)

Ministry of Coal invited application for allocation of 3 coal blocks for CTL project. In response 28 offers have been received are in the process of being examined on technical and financial aspects.

The Coals Blocks in Talcher coalfield are;

1. North of Arkhapal 2. Ramchandi block 3.Srirampur Block

Pilot scale R & D work is in progress at Indial Oil Lab at Jorhat and CIMFR at Dhanbad

Perspective Plan for grid-interactive Renewable power for yr. 2022 i.e. 13th Plan period

All Capacity in MW

Resources	Up to 9th. Plan	Up to 10th. Plan	Up to 11th. Plan	Up to 12th & 13th. Plan	Total
Wind Power	1667	5333	10500	22500	40,000
Small Hydro	1438	522	1400	3140	6500
Bio Power	368	669	2100	4363	7500
Solar power	2	1			3
Total	3475	6525	14000	30003	54003

The capital outlay projected for the XI Plan

Company	(Rs. Crores)
Coal India Limited (Additional coal production of 156.7 mts)	15,875
Singareni Collieries Co. Limited (Additional coal production 40.7mts)	3,340
Neyveli Lignite Corporation Limited – Lignite Mines -2801 Coal Mines-25, Neyveli Lignite Corporation Limited – Power(Lignite) – 7948 NLC Coal Based Power-4094	15,044 Total PSU 34,259
MoC Schemes (funded by domestic budgetary support), Exploration – Rs 1653.44 Crs, R&D – 214.40 Crs, EMSC/Jharia Action Plan – Rs 4622 Crs, CCDA- Rs 1665.60 Crs	1,200
Dept. schemes Prom. Explo.383.50 Detl. Dril.- NonCIL blocs.780 crore; Detl. Dril non-NLC blocks 33 ; Core Analy. 3.5 (total 1200); R&D.214.40; EMSC/Jharia Action Plan 4622 crore; CCDA (stowing.etc. 692.95 Rs.& road/rail infrastructure 972)	7702
125% more than the X Plan outlay Grand Total	42161

Additional investment required for captive coal blocks (production of 104 Mt. in Yr. 2012) would be Rs.10,000 Crs and for additional 140 Mty washing capacity, Rs 2200 Crs would be needed

Thrust areas for action

- Permitting private participation in non-captive mining through suitable legislative amendments.
- Revival of loss making coal companies and restructuring of the coal sector by providing autonomy to individual coal producing companies to encourage competition.
- Setting up of a regulatory authority for ensuring fair competition in the coal sector.
- De blocking of coal blocks held by CIL for offer on bidding basis to public and private parties.
- Permitting outsourcing of certain mining operation through appropriate legislative amendments for improving the economics of operations.
- Permitting free trade of coal.
- Intensification of exploration and gradation of coal (GCV)
- Rapid development of lignite resources.

THANK YOU