



India Energy Outlook

株式会社 サン・アンド・サンズ アドバイザーズ

サン・アンド・サンズ アドバイザーズ

日本で最もインドを知るチーム



SSAは、インド市場を熟知したインド人と日本政財界を深く経験した日本人との絶妙なコンビネーションによる、『日本で最もインドを知るチーム』と自負しており、上記のサービスを提供することによって、貴社のインド展開を確実にサポートいたします。

アフターブ・セット(会長)

元駐日インド特命全権大使。慶應義塾大学に留学後、インド外務省に勤務し、1998年から2002年まで駐日インド大使として赴任。日印両国の政財界に幅広い、強い人脈を持つ。

榎 泰邦(主席顧問)

前駐印日本特命全権大使。2001年から2003年まで南アフリカ大使を務めた後、2003年から2007年まで駐印日本大使を歴任。退任後、三井物産顧問を務め、広く政財界に人脈を持つ。

サンジーヴ・スィンハ(代表取締役社長)

タタ・アセット・マネージメント日本代表、インド工科大学(IIT)同窓会代表、NPO 法人TiE 東京支部設立者。インド工科大学(IIT)を卒業。来日後ゴールドマン・サックスやみずほ証券、UBSなどを経て、2008年にSSAを設立。様々な分野に広い人脈を持ち、日印間の架け橋となるべく活動中。

INDIA

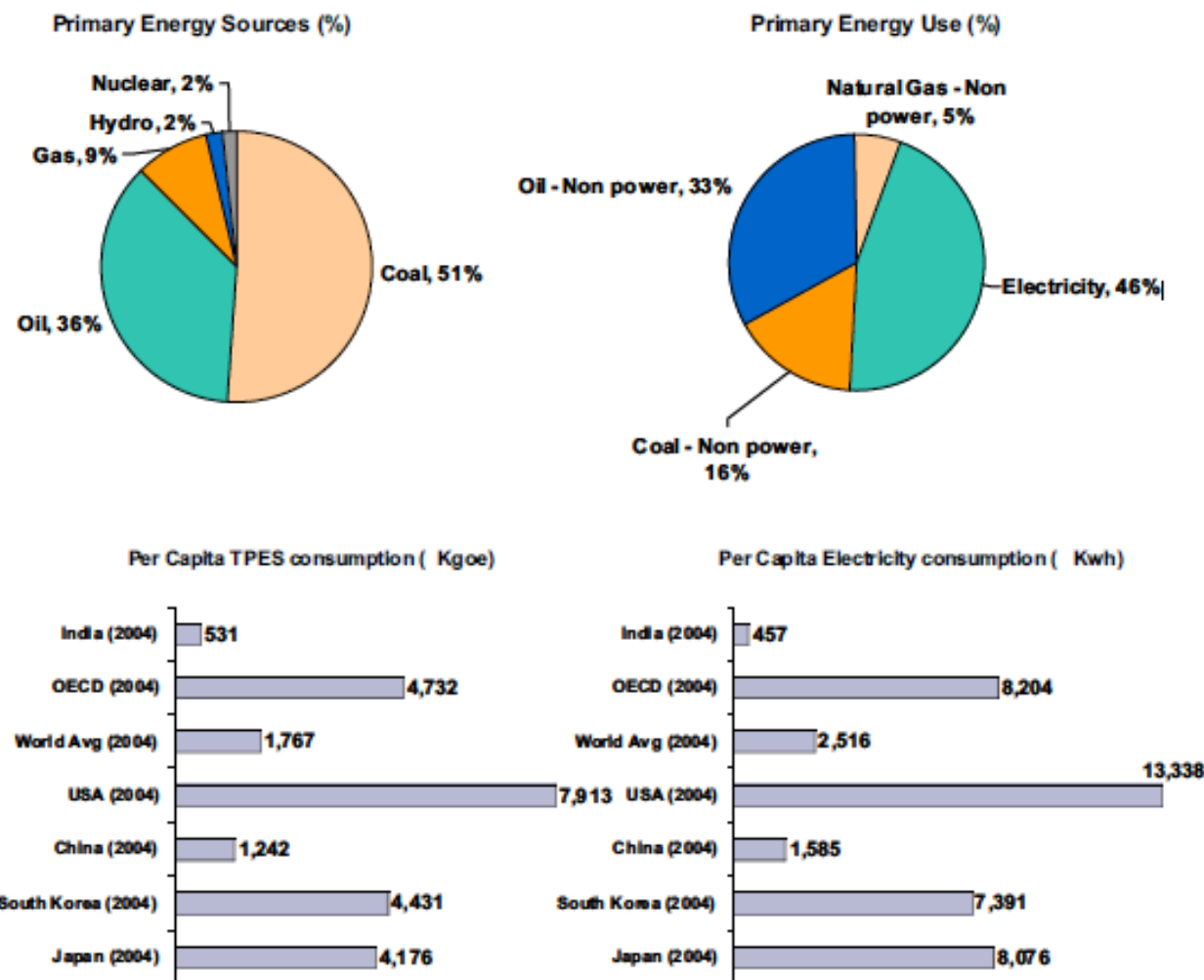


- Total population of India: 1.2 billion (2010 est.)
- Population Growth Rate: 1.548% (2009 est.)
- In 2030, Population Estimate: 1.53 billion
- From 2004 until 2010, India's average quarterly GDP Growth was 8.37 percent
- 5th largest consumer of energy in the world
- 3rd largest consumer (est. 2030)

ENERGY MIX of INDIA



Exhibit 2.2: India's composition of energy sources and usage

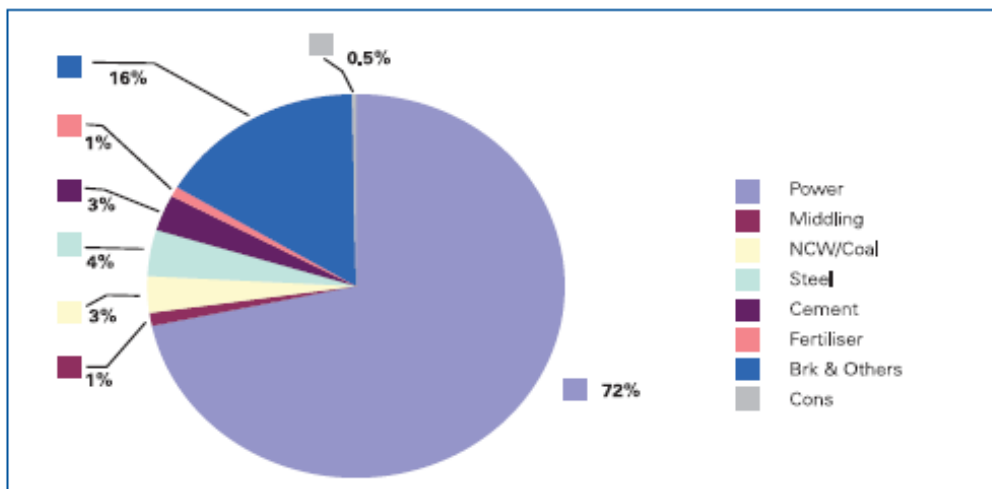


Source: International Energy Agency, Key World Statistics 2006

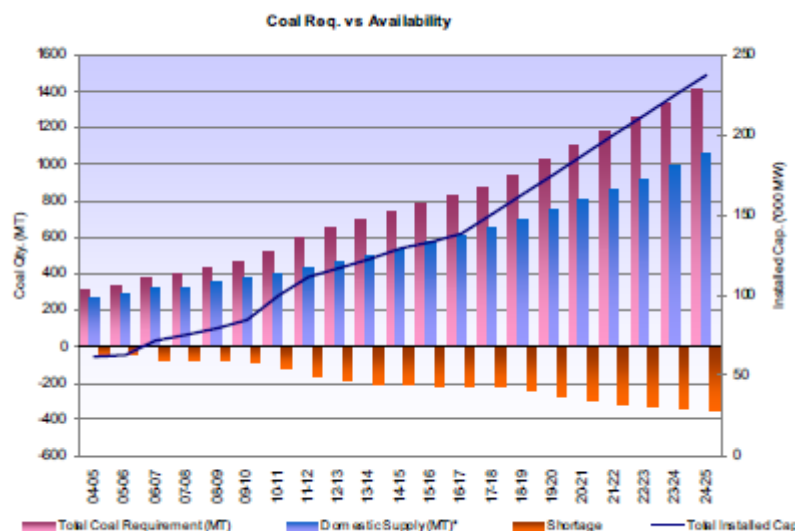


COAL

Exhibit 3.1: Comparison profile



So Exhibit 3.2: Coal requirement vs availability



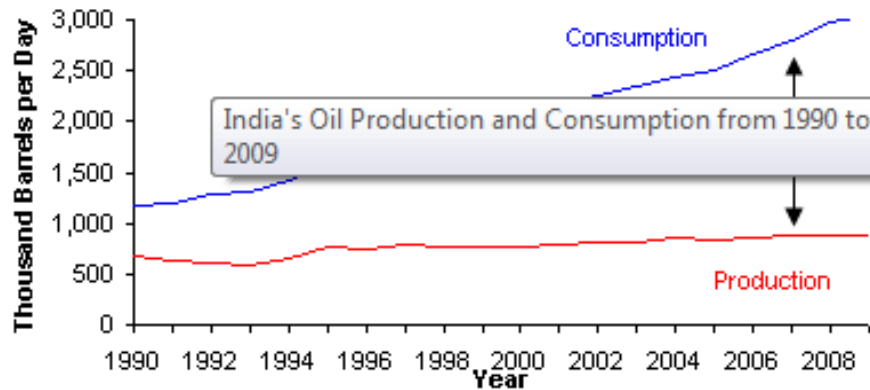
Source: Infraline

- 51% of India's energy needs
- 2009 Coal reserves of 58600 MT, 7.09% of the world total
- 2009 coal production of 557.57 MT, 6.2% of the world total
- Estimated shortfall of 100 MT in 2011-12 and 250 MT in 2019-20

OIL



India's Oil Production and Consumption
1990-2009*



Source: U.S. Energy Information Administration

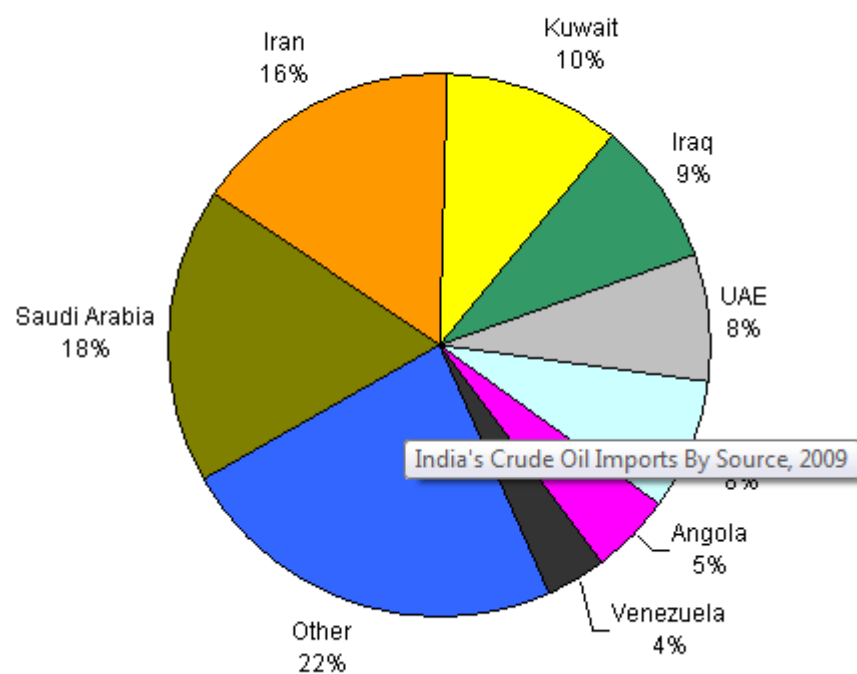
*2008-09 is forecast

- India had approximately 5.6 billion barrels of proven oil reserves as of January 2010
- India produced roughly 880 thousand barrels per day (bbl/d) of total oil in 2009
- In 2009, India consumed nearly 3 million bbl/d, making it the fourth largest consumer of oil in the world

OIL



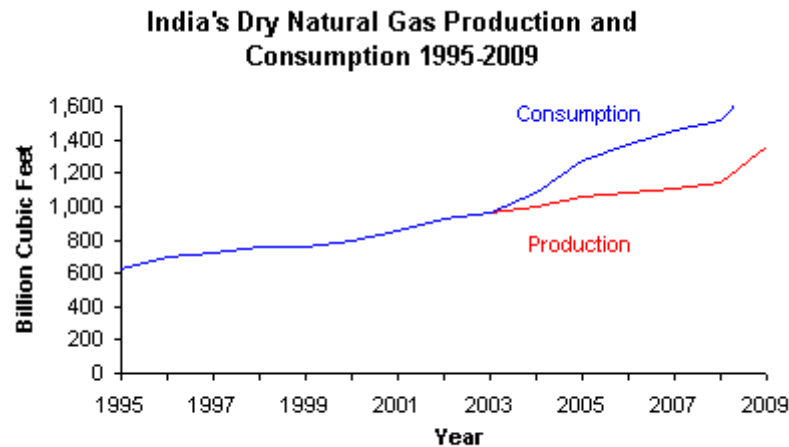
India's Crude Oil Imports By Source, 2009



Source: Global Trade Atlas

- Indian oil demand is likely to rise by 3.9 percent every year until 2030
- By 2020, India is expected to overtake Japan in oil consumption
- **Indian demand is seen jumping from 3 million bpd in 2008 to 6.9 million bpd in 2030**

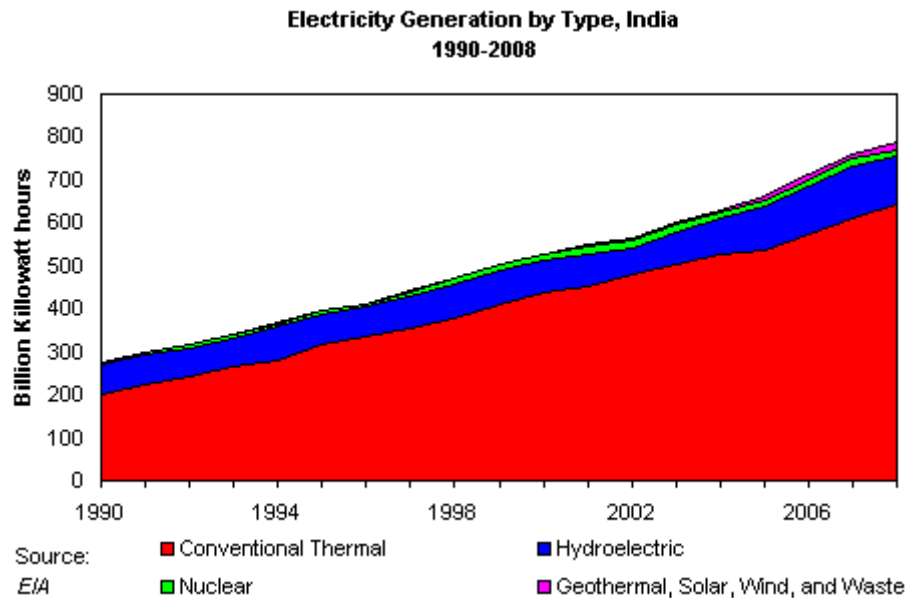
NATURAL GAS



Source: U.S. Energy Information Administration

- The share of natural gas in India's energy basket is only 9% compared to world average of 24%
- Demand: 120 mmscmd
- Supply: 75 mmscmd
- Trend of conversion of existing fuels to NG
- Lowest per capita consumption in the world (29 cu m as compared to world average of 538 cu m)
- The share of natural gas is expected to go up in the energy mix from 8.8% to 22% by 2030-31

ELECTRICITY (Contd.)



- Installed capacity: 162 GW
- Total production: 761 billion kwh (2007)
- Thermal: 70%
- Hydro: 16%
- Nuclear: 3%
- Other Renewable: 10%
- Target to add 78 GW in 11th Plan ending 2012
- The total demand for electricity in India is expected to cross **950 GW** by 2030

ELECTRICITY (Contd.)



Thermal Power

- Current installed capacity of Thermal Power is 104,424 MW (63.7% of total installed capacity)
- Current installed base of Coal Based Thermal Power is 86,003 MW (53% of total installed base)
- Current installed base of Gas Based Thermal Power is 17,221 MW (10.61% of total installed base)
- Current installed base of Oil Based Thermal Power is 1,199 MW (0.74% of total installed base)

ELECTRICITY (Contd.)



Nuclear Energy

- Nuclear Power Plant capacity targets:
 - 10,280 MW by 2012
 - 20,000 MW by 2020
 - 50,000 MW by 2030
 - 250,000 MW by 2050
- Indo-US nuclear Cooperation
- Fast Breeder Reactor Program (fuel self-sufficiency)

Solar Energy

- Currently only 0.4% of total energy
- Huge potential; 300 clear sunny days and 4-7kwh/m² of incident radiation
- High Cost (Rs. 15 to 30 per kwh)
- JNNSM: 20 GW by 2020, Govt. to invest USD 19 Billion

Energy Projections for 2030-31



	Utilization in 2031 (Mtoe)		Current Utilization (Mtoe)	
Oil	350-486	12%-13%	119	25%
Natural Gas	104-150	3%-4%	29	6%
Coal	632-1022	21%-28%	167	35%
Hydro	13-35	0%-1%	7	1%
Nuclear	76-98	3%	5	1%
Solar	1200	33-40%	1	0%
Wind	10	0%	1	0%
Fuel wood	620	20%	140	30%
Ethanol	10	0%	1	0%
Bio diesel	20	1%	1	0%
	3035		471	

India's development needs and Challenges



Increase Access

- **At least 400 million without electricity access (vs. 20 million in China in 2008)**
 - Two-thirds of households rely on biomass for cooking

Improve Efficiency and Governance of Distribution Sector

- **40% AT&C losses; reducing to 15% => \$4.4b additional revenues per year**
 - Low cost recovery from tariff (82% for FY2007)

Expand and Diversify Power Generation

- **Current installed capacity of 160 GW (vs. China's 800 GW)**
 - Biggest bottleneck to industrial growth and new investment: 60% of firms rely on captive power (vs. 21% in China)
 - Peak Deficit at 16.6%, Energy Deficit at 9.9%,
 - Econ. Cost of Shortages estimated at 7% of GDP

Growing CO2 Emissions

- **Power sector represents 50% of India's CO2 emissions (0.5 bt/yr -> 2.3 bt/yr by 2031) 53% installed capacity and 70-80% generation from coal-fired plants**

GOVT. OF INDIA: Priorities

As laid out in 11th Plan and National Action Plan on Climate Change



EXPAND GENERATION

- Add about 80,000 MW capacity in 11th Plan
 - including increasing installed hydro capacity by 46% by 2012 (addl. 15 GW)
- Energy Efficiency
 - Rehabilitate and modernize about 27,000 MW of old coal-fired power plants
 - Increase share of supercritical to 20% of new installations in 11th Plan
 - Demand Side Management
- Increase Renewables (SMH, Wind, Biomass) to 10% of installed capacity by 2012 (from current 4%)
- Increase Solar share in energy mix to 20,000 MW by 2020 with 50% CSP

IMPROVE QUALITY OF SUPPLY AND SERVICE

- Expand inter-regional transmission from 10,000 MW to 37,000 MW by 2012
- Upgrade & expand distribution networks & MIS (target 15 % ATC losses)

EXPAND ACCESS TO REACH ALL BY 2012

- With Conventional & Renewable Energy Sources in On/Off-Grid Approaches
- Through Utility, Franchisee, or other Business Models

COMPLY WITH ENVIRONMENTAL AND SOCIAL SAFEGUARDS

India Japan Collaboration in Power Sector



- New Project Finance and Private Equity Platforms.
- Technology Transfer: Demand for Coal and Solar technology from Japan.
- India Japan Eco Business Forum with Minister Kamal Nath, Minister Anand sharma and Mr. Masakazu Toyoda.



ご静聴ありがとうございました
Thank you.

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