Energy Situation and Policy in India

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Why Analyze the Energy Situation and Energy Policy in India?

- Rapid economic growth and large growth potential
- Increase in energy demand and higher degree of dependence on import
- Influence on international energy market and global environment issue

  It is considered to be one of background causes for:
  - Tight situation in the international oil and energy market,
  - Surge of crude oil prices,
  - Increase in CO2 emission, etc.

- For the balance of energy supply and demand, as well as market stability in Asia and the world from now on, and for the future of issues such as the global environment, (i) the energy situation and (ii) policy development in India may have a great impact.

Necessity to Analyze Energy Situation in India

- Increasing energy demand under the high international oil prices
- Slight improvement in energy efficiency
- Growing gap between oil supply and demand and increasing crude oil import
  - Increasing oil consumption
  - Domestic oil development/production lagging behind demand
  - Acquisition of overseas assets and resources by state-owned oil company
- Several gas import plans and expanding coal imports
- Electric power supply and demand gap and fuel selection

- Possibility of future impact on supply and demand balance in the international energy market according to the energy situation in India

Necessity to Analyze Energy Policy Development in India

- What kind of effect does policy development have on the following points?
  - Will energy-saving and improvement of energy efficiency progress?
  - Will the introduction of private and foreign capitals on domestic oil and gas development progress?
  - Will the acquisition of overseas resources continue?
  - Will gas imports progress according to the plan?
  - Will the gap between electricity supply and demand be eased?
  - Will the situations such as controlled price and allocation system be resolved?

- The development of energy policy may have an impact on energy supply and demand in India, and eventually on the international energy market.

Overview of India (1)

- Country name: The Republic of India
- Population: 1.087 billion (FY2004)
- Total area: 3.29 million km^2
- Capital: New Delhi
- Ethnic composition: Indian (72%), Dravidian (25%), and others
- Religion: Hinduism (80%), Islam (14%), and others
- President: APJ Abdul Kalam
- Prime minister: Manmohan Singh
- Total GDP: 727.8 billion dollars (FY2005)
- GDP per capita: 714 dollars (FY2005)
- GDP growth rate: 8.4% (FY2005)

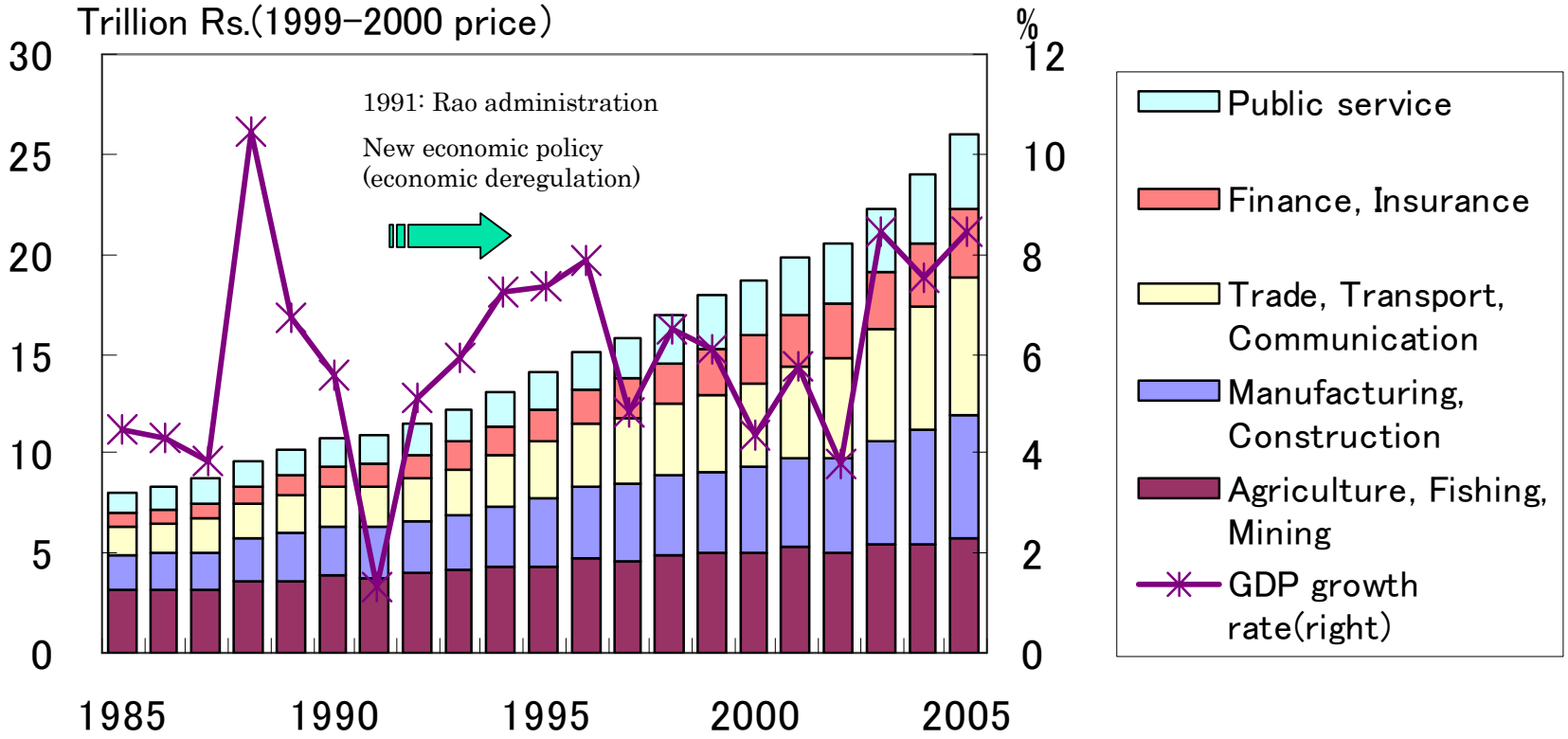
(Reference) China
Population: 1.29 billion
Area: 9.6 million km2
GDP: $1,191.2 billion
GDP/capita: $1,283

Overview of India (2)

- Oil reserves: 5.9 billion barrels (0.5% of the world)
- Gas resources: 1.1 trillion square meters (0.6% of the world)
- Coal resources: 92.4 billion tons (10.2% of the world)
- Primary energy supply: 550 million TOE (5.2% of the world)
- Primary energy supply per capita: 0.5 TOE/person
- Primary energy supply per GDP: 1.0 TOE/thousand dollars
- Energy-derived CO_2 emission: 1.1 billion tons CO2 (4.2% of the world)
- Energy dependence on import: 18.0%
- Oil dependence on import: 68.9%
- Oil import dependence on Middle-East: 67.4%

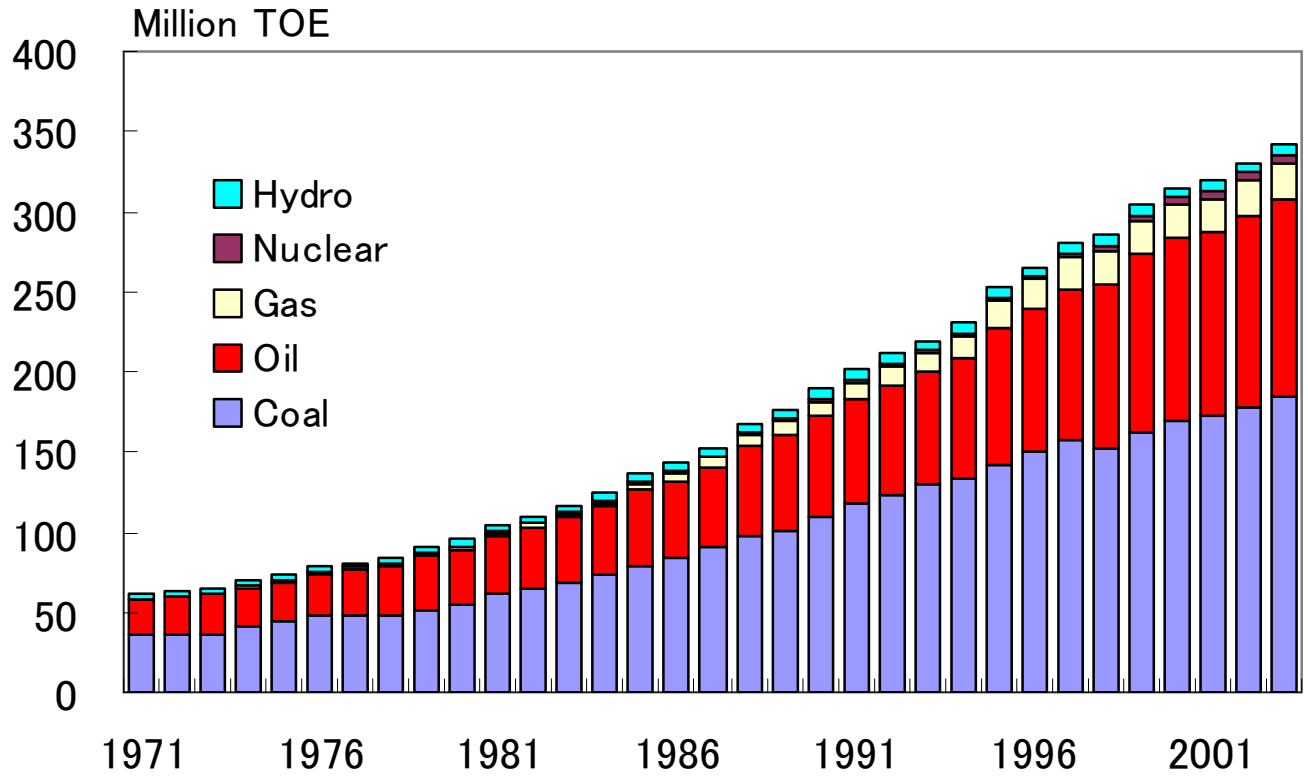
(Reference) China
Oil resources: 16 billion barrel
Gas resources: 2,400 billion sq m
Coal resources: 114.5 billion tons
TPES: 1.4 billion tons
TPES per capita: 1.1 tons/person

Economic Growth in India (GDP)

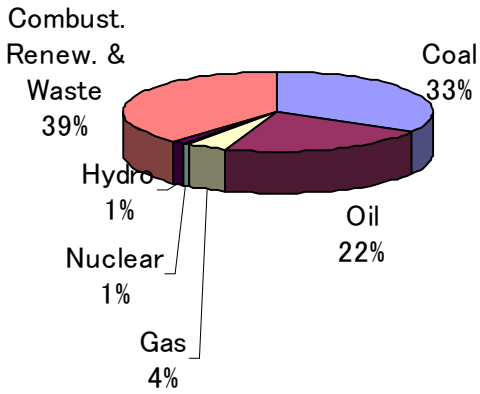


(Source) Central Statistic Organization, India

Primary Energy Supply in India

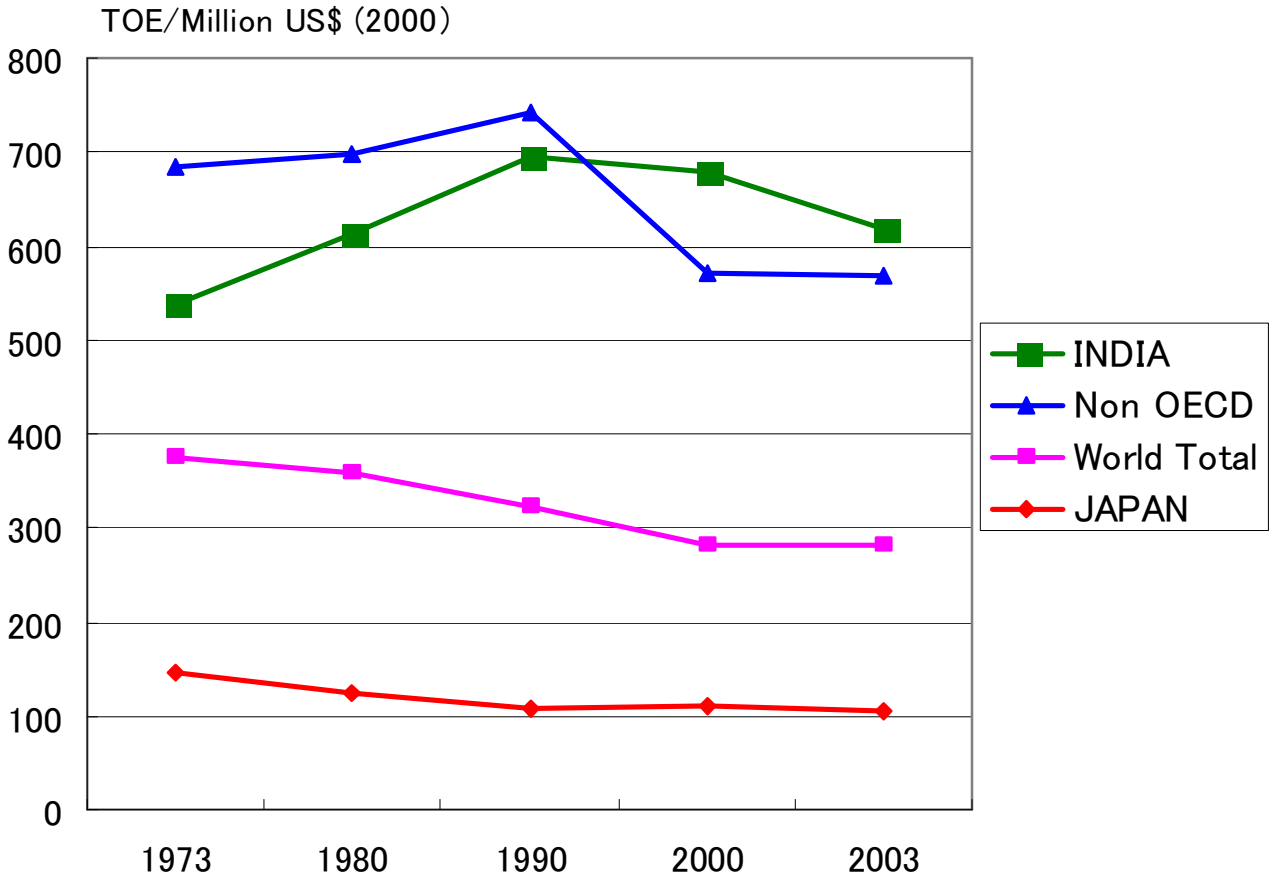


(Reference)
Total of primary consumption including combustible renewable and waste (2003): 550 million TOE



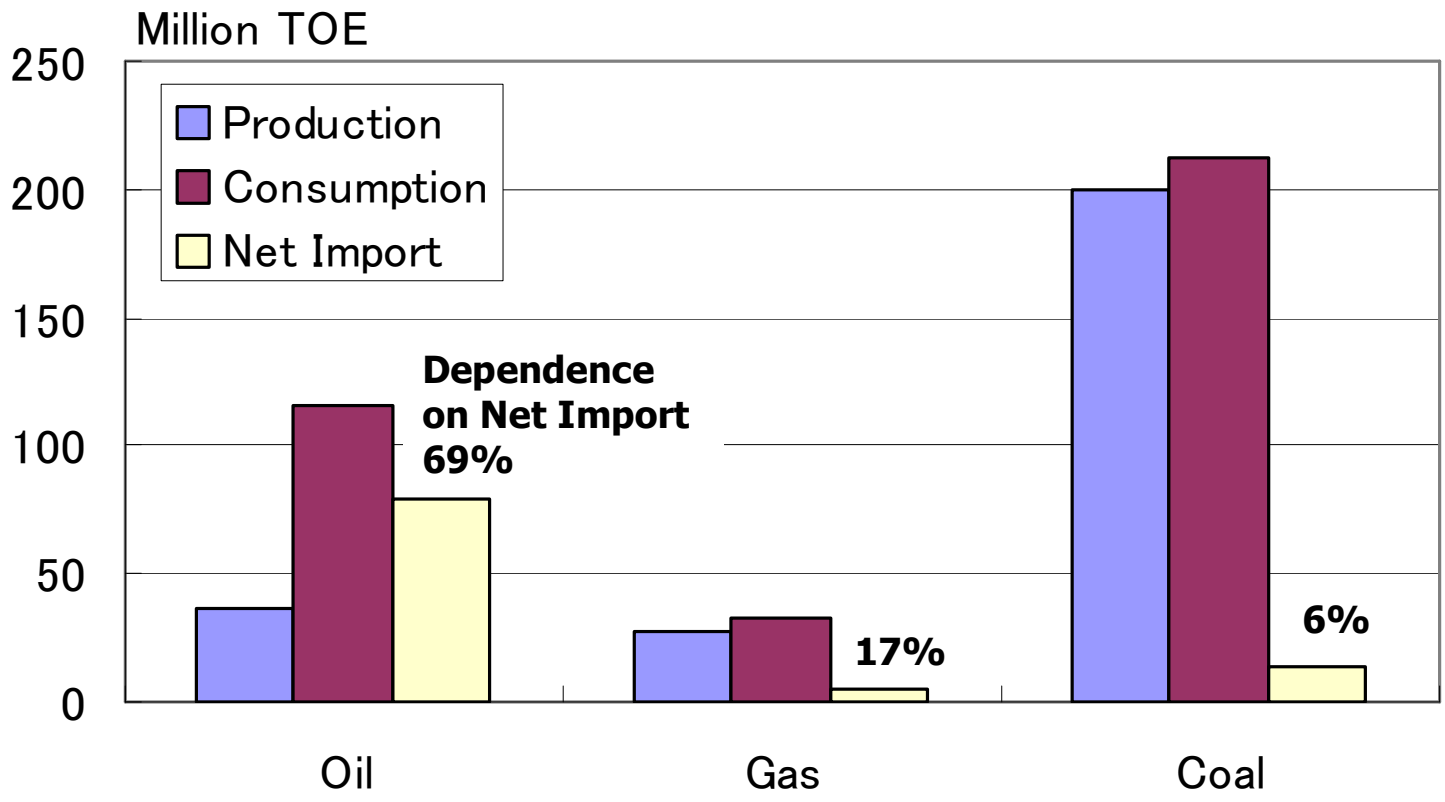
(Source) IEA「ENERGY BALANCE OF NON-OECD COUNTRIES」

Energy Intensity for India



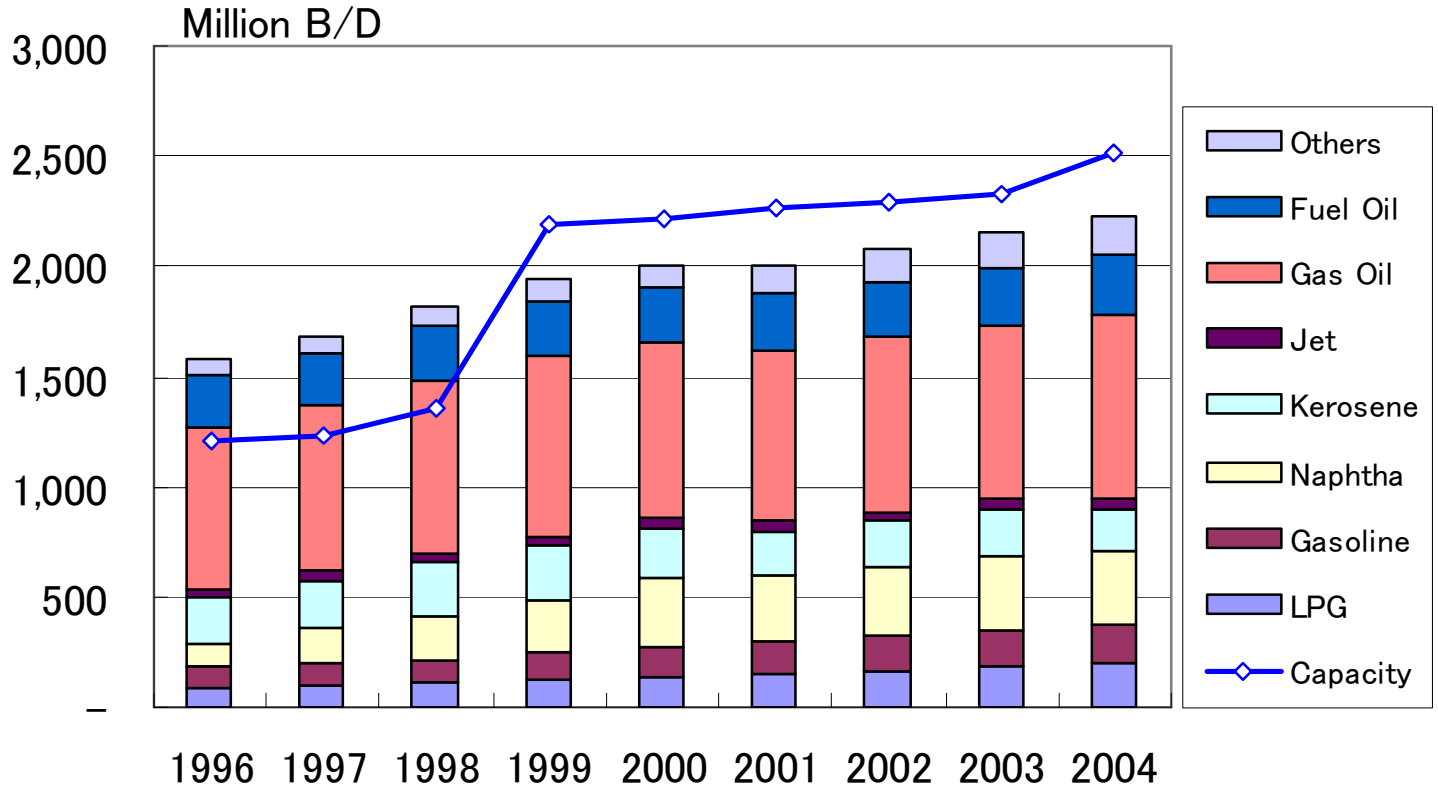
(Source) IEA「ENERGY BALANCE OF NON-OECD COUNTRIES」

Supply/Demand Balances by Fuel in India (2005)



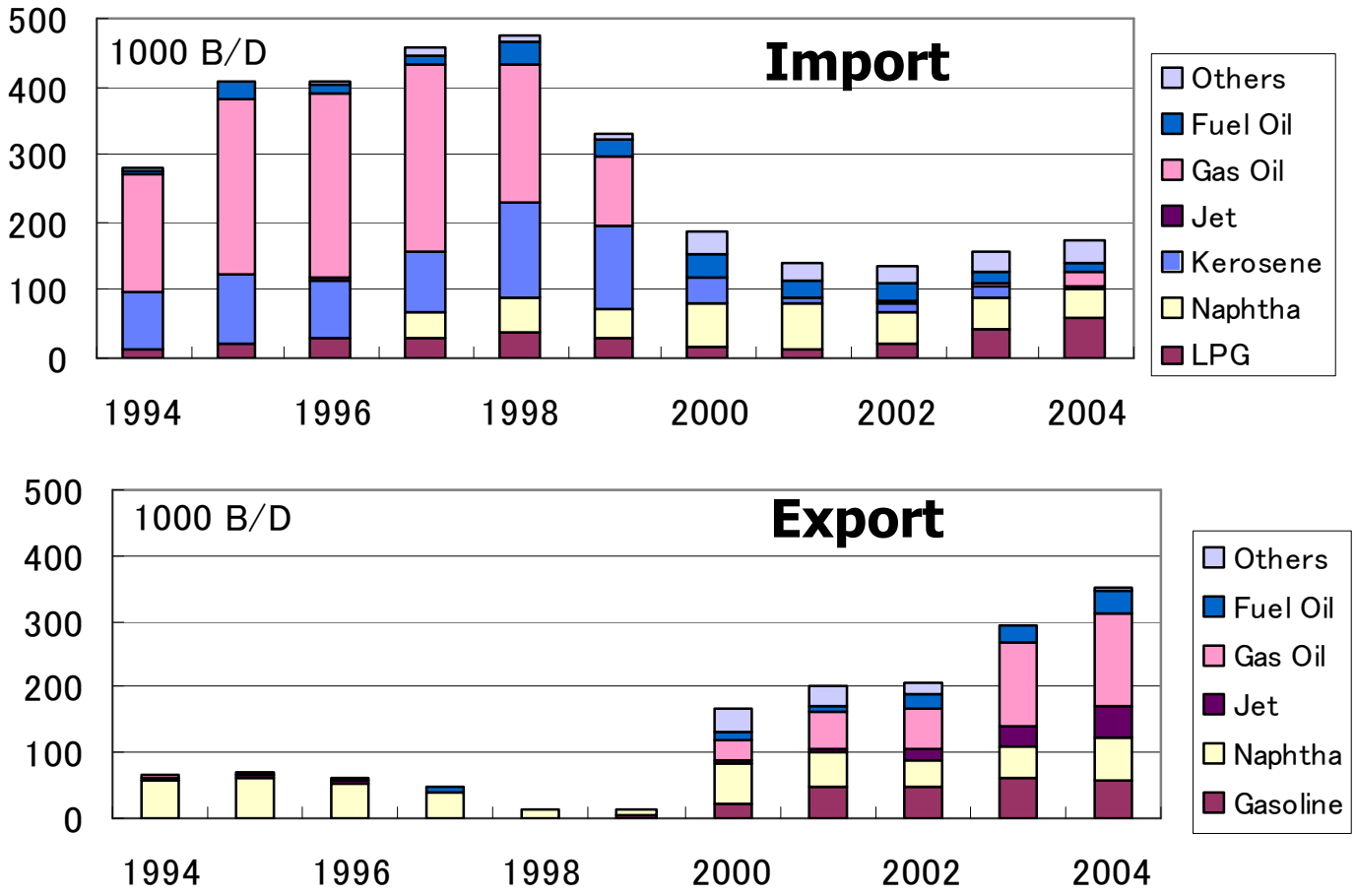
(Source) BP Statistical Review of World Energy June 2006

Demand by Petroleum Products and Refinery Capacity in India



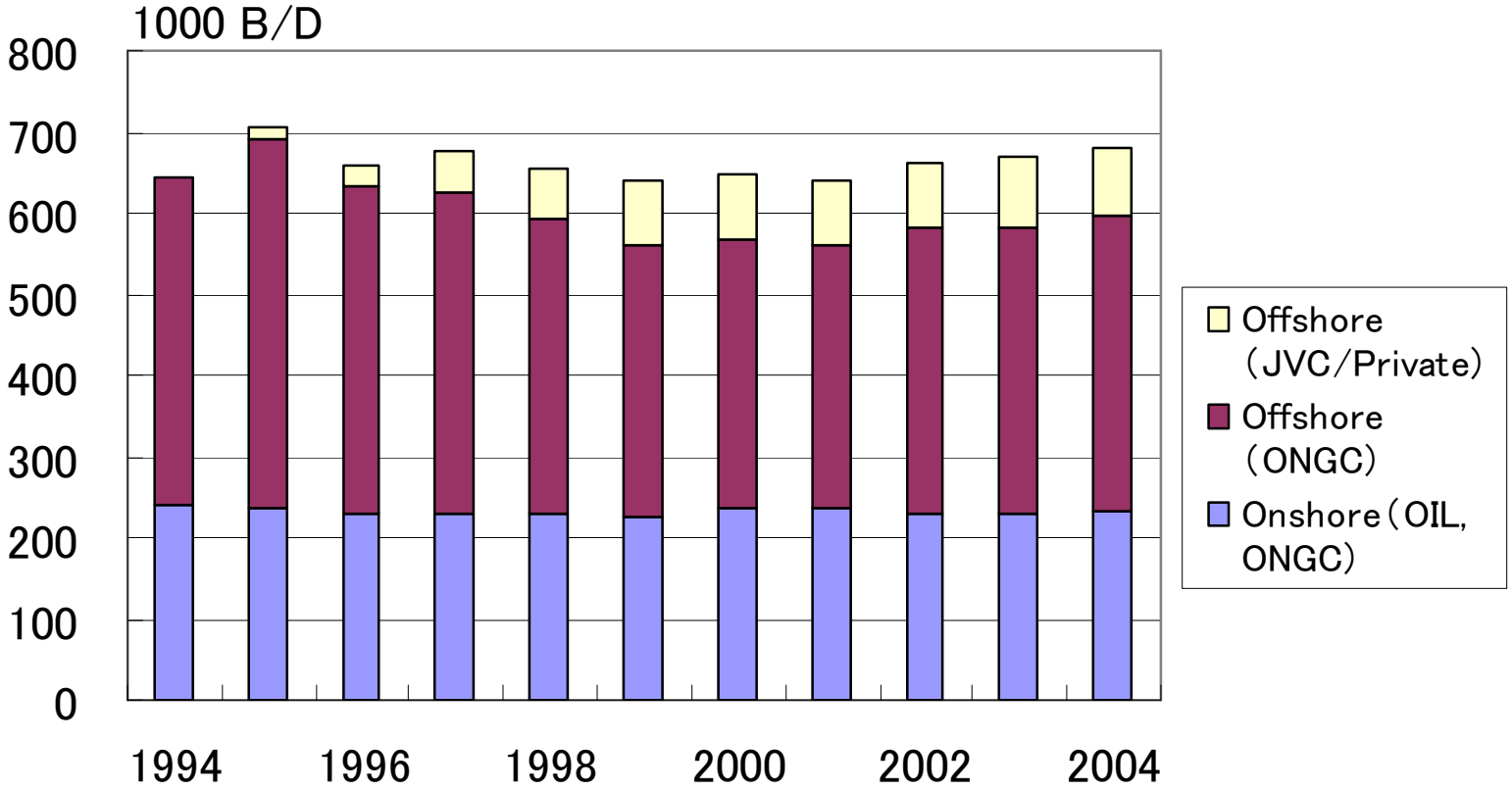
(Source) BP Statistical Review of World Energy June 2006,
Basic Statistics on Indian Petroleum & Natural Gas (MoPNG)

Import/Export by Petroleum Products in India



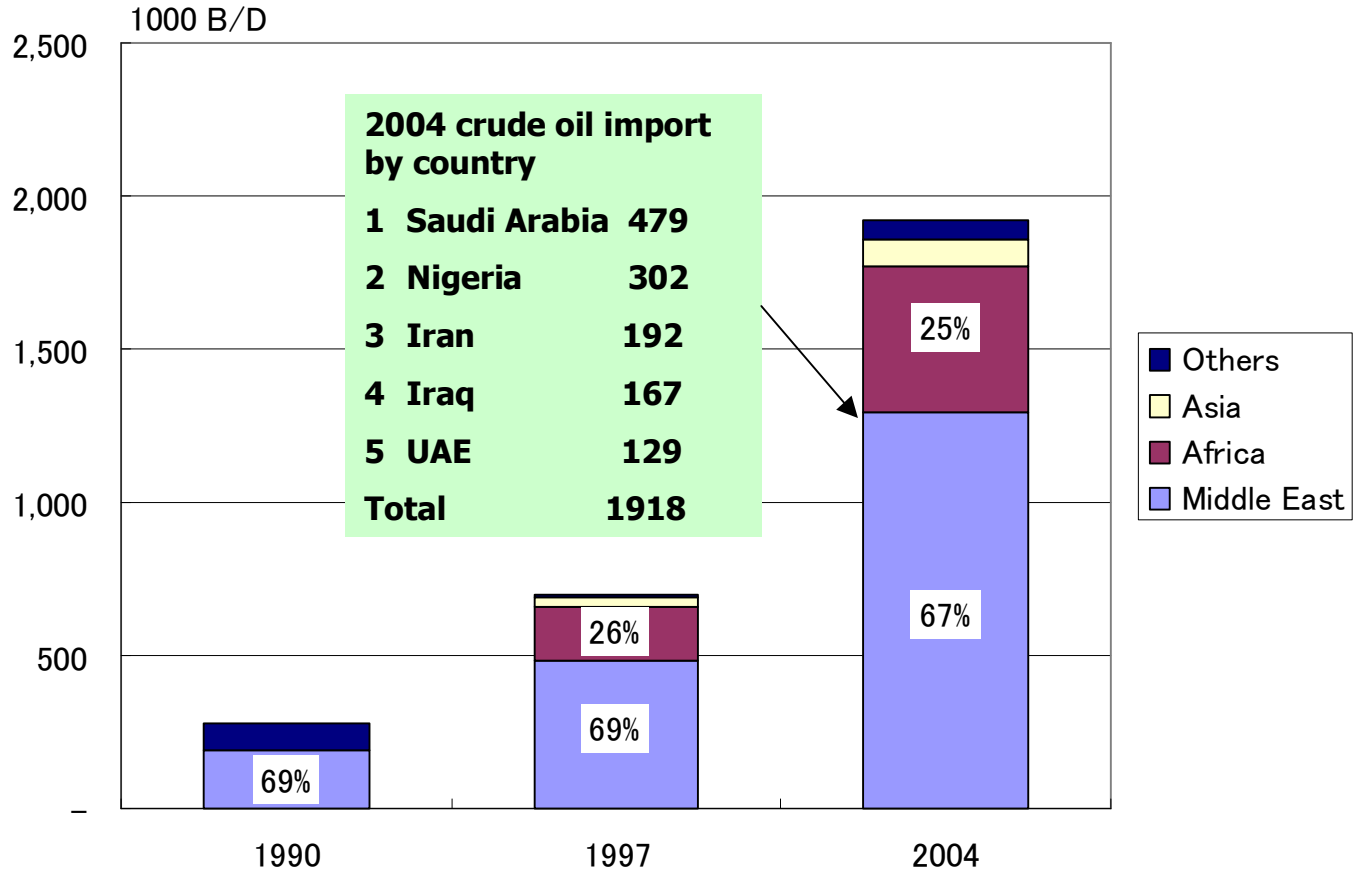
(Source) TERI "TEDDY 2004/2005"

Crude Oil Production in India



(Source) TERI "TEDDY 2004/2005"

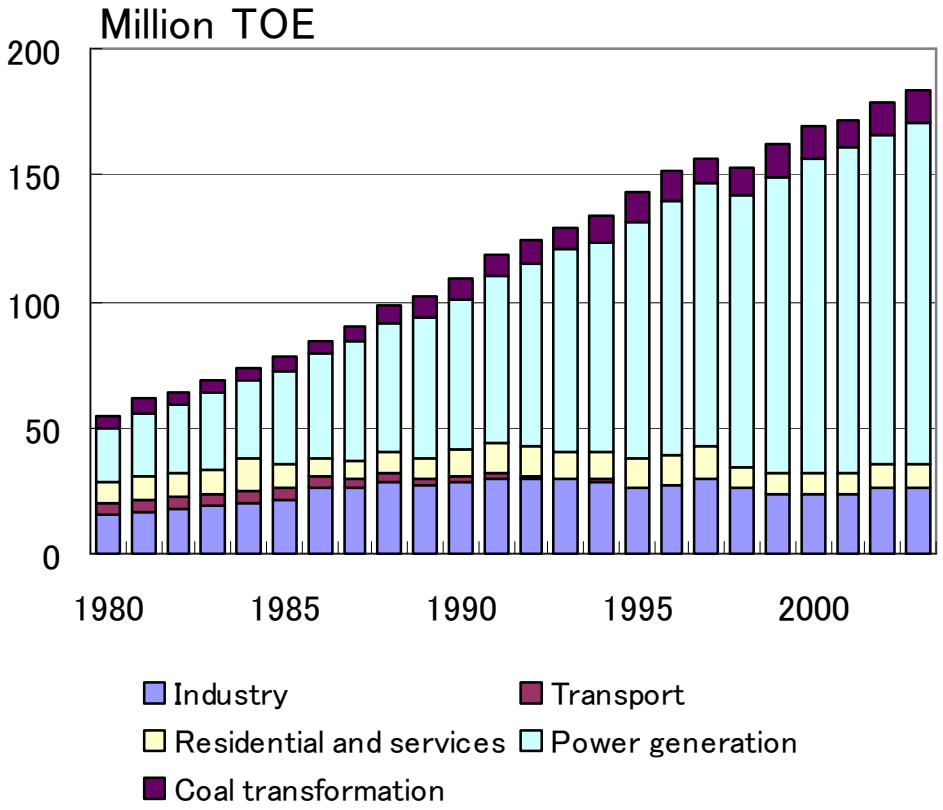
Crude Oil Import by Region in India



(Source) Blackwell "World Oil Trade" by Planning Commission of India (2005)

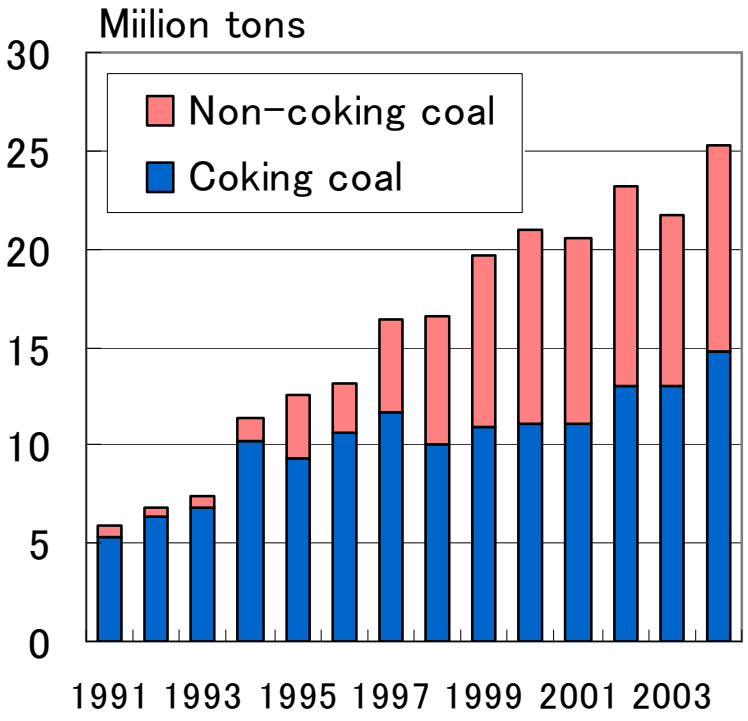
Coal Demand and Import in India

Coal Consumption



(Source) IEA-Energy Balances of non-OECD Countries

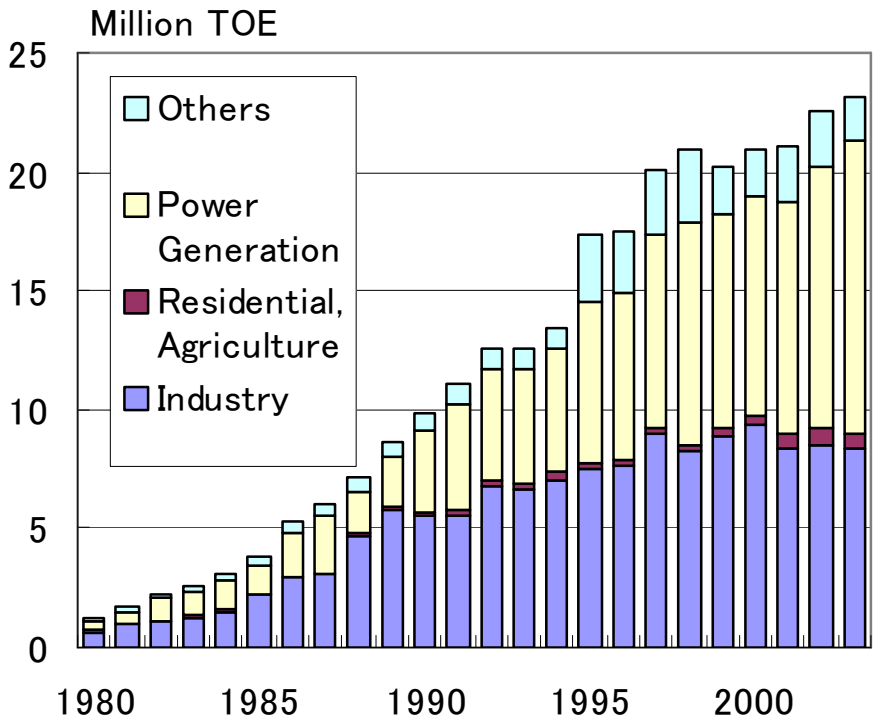
Coal Import



(Source) TERI "TEDDY 2004/2005"

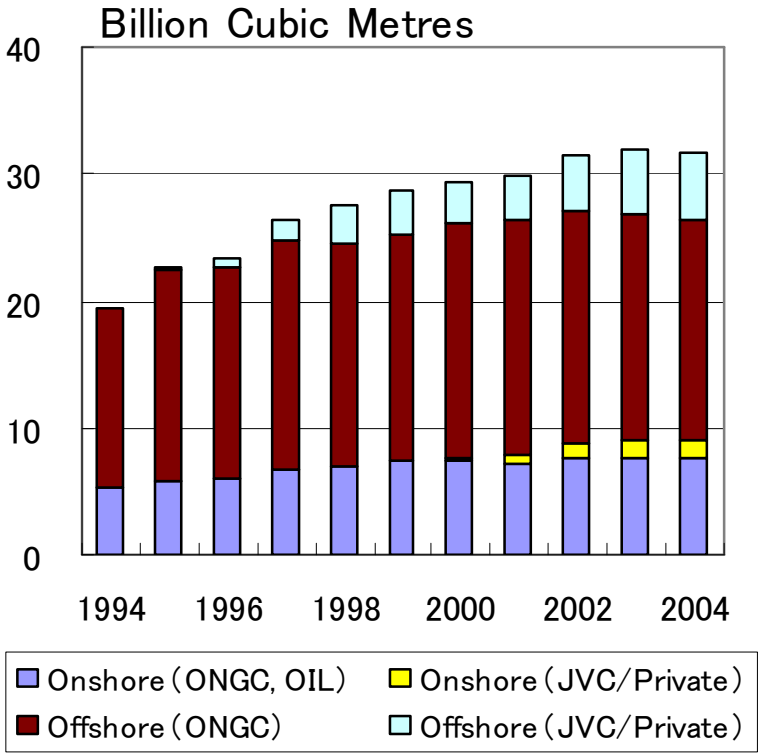
Gas Supply and Demand in India

Natural Gas Consumption



(Source) IEA-Energy Balances of non-OECD Countries

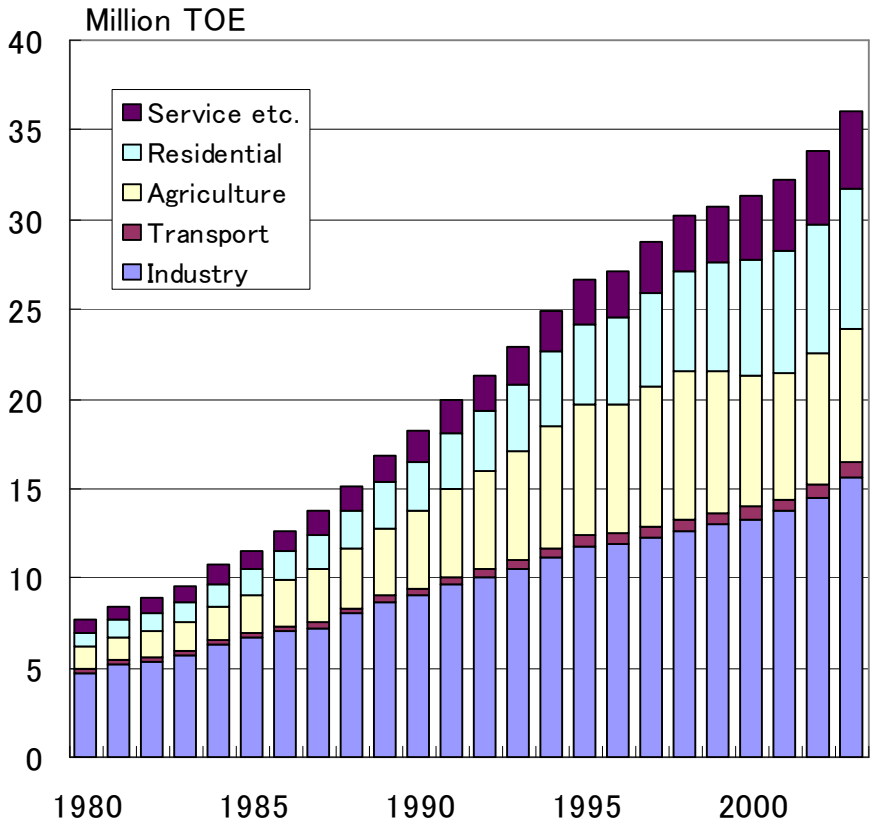
Natural Gas Production



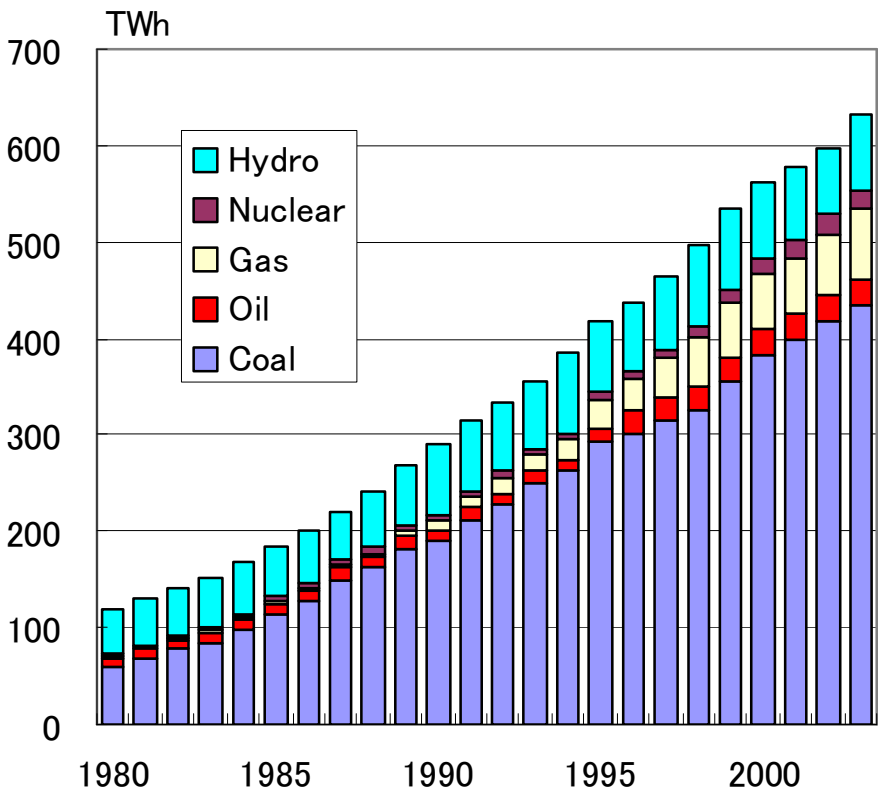
(Source) TERI "TEDDY 2004/2005"

Electric Supply and Demand in India

Electricity Consumption



Electricity Generation



(Source) IEA-Energy Balances of non-OECD Countries

Primary Energy Supply Outlook (Planning Commission of India)

◆The Tenth Five-Year Plan (2002)

Average annual GDP growth:
FY02-06: 8.0%
FY07-11: 9.3%

		FY2006		FY2011	
Commercial use	Coal	205.51	(49.8)	276.98	(50.0)
	Oil	144.58	(35.1)	185.40	(33.5)
	Gas	42.70	(10.4)	57.60	(10.4)
	Hydro	12.73	(3.1)	18.54	(3.3)
	Nuclear	6.04	(1.5)	14.16	(2.6)
	Wind power	0.35	(0.1)	1.00	(0.2)
	Subtotal	411.91	(73.1)	553.68	(76.5)
Non-commercial use		151.30	(26.9)	170.25	(23.5)
Total		563.21	(100.0)	723.93	(100.0)

Source: PC, 10th Five Year Plan (2002-2007)
Unit: Million tons oil equivalent, figures in ( ) show the composition ratio %

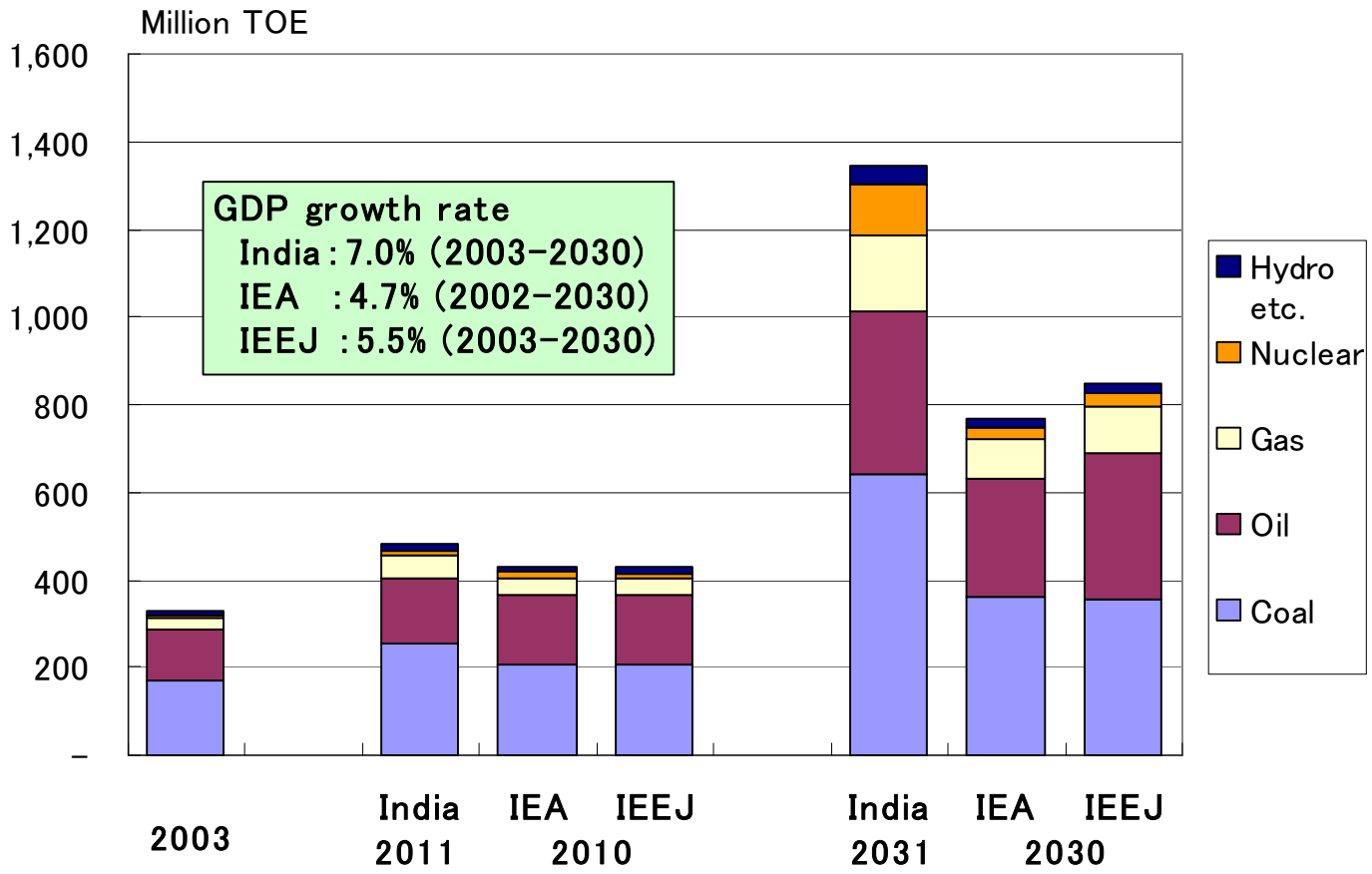
◆The Eleventh Five-Year Plan (2005)

Average annual GDP growth:
FY03-31: 7.0%

	FY2011		FY2031		31/03
Coal	253	(52.4)	641	(47.7)	5%
Oil	151	(31.3)	370	(27.5)	4%
Gas	49	(10.1)	175	(13.0)	7%
Hydro	15	(3.1)	43	(3.2)	7%
Nuclear	15	(3.1)	115	(8.6)	12%
Total	483	(100.0)	1344	(100.0)	5%

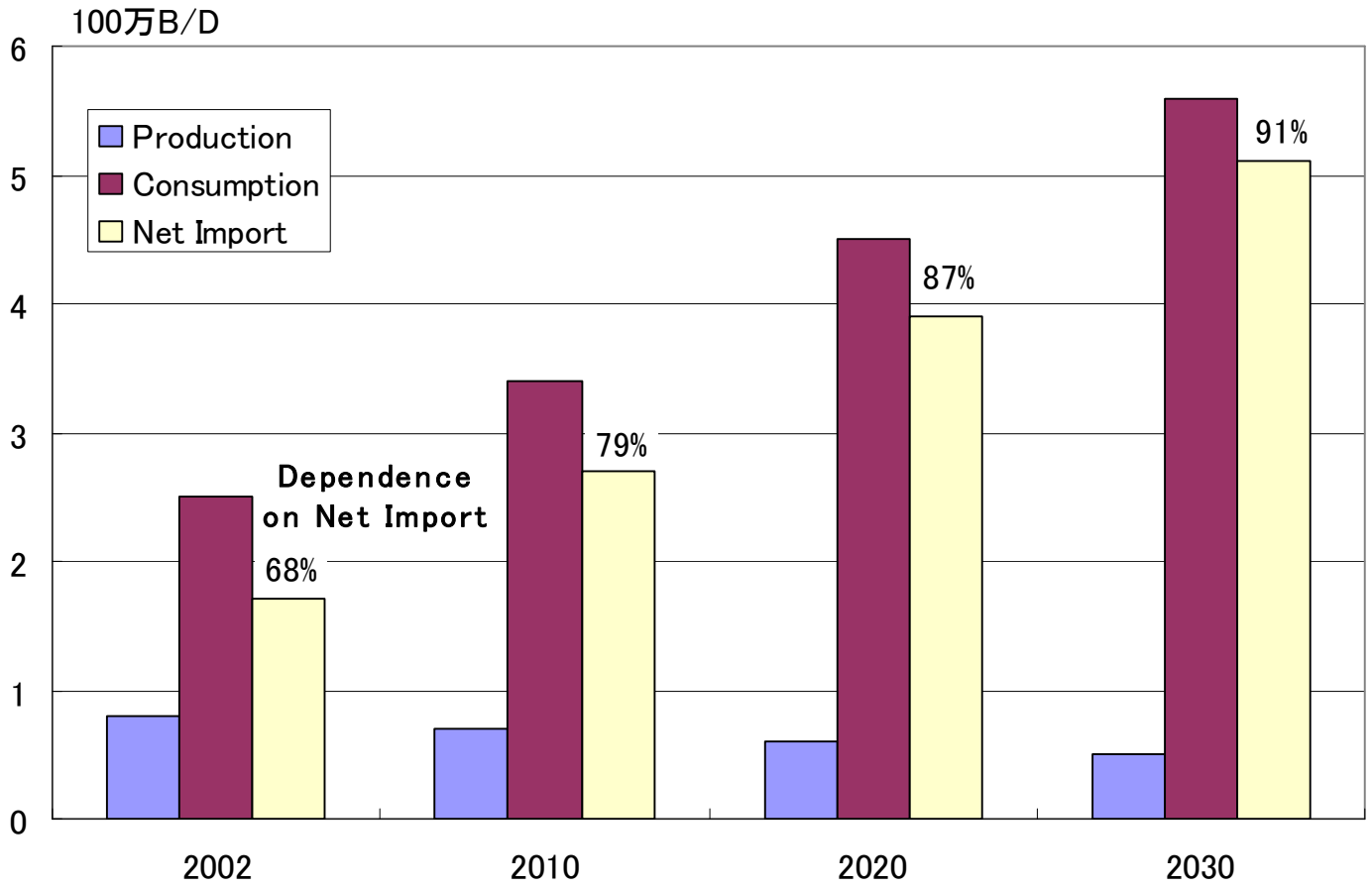
Reference: Electric demand forecast for FY03-31: 5.9%
Source: PC, Draft Paper of the Expert Committee on Integrated Energy Policy (2005)
Unit: Million tons oil equivalent, figures in ( ) show the composition ratio %

Comparison of the Outlook on Primary Energy Supply in India



(Source) India (2006) "Draft Paper of the Expert Committee on Integrated Energy Policy," IEA (2004) "World Energy Outlook 2004," IEEJ(2006)

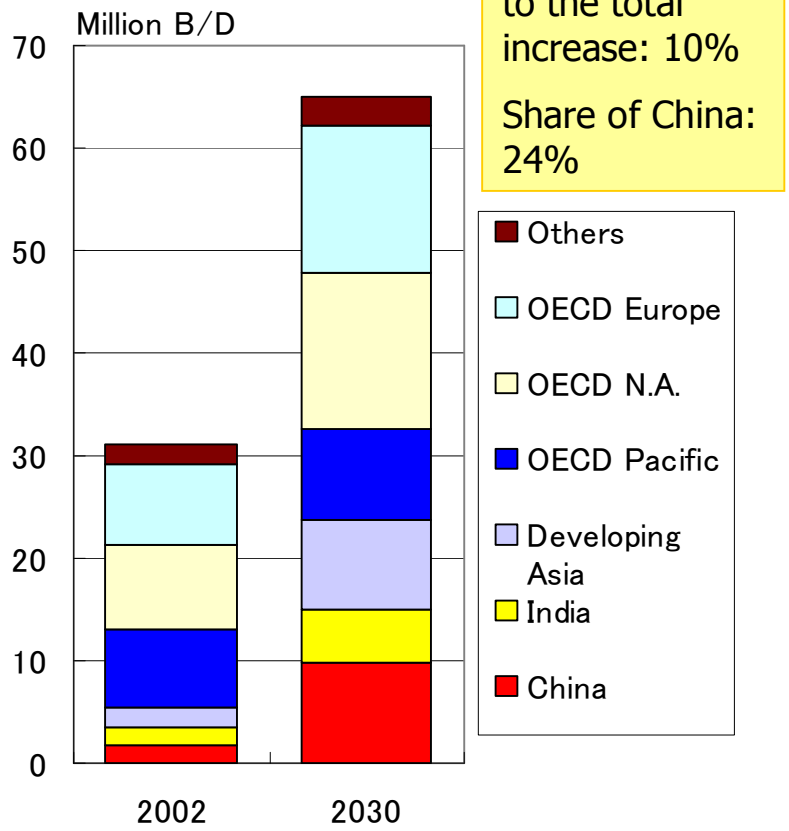
Outlook of Oil Supply and Demand in India (IEA)



(Source) IEA, "World Energy Outlook 2004"

Position of India in Oil and Gas Trade

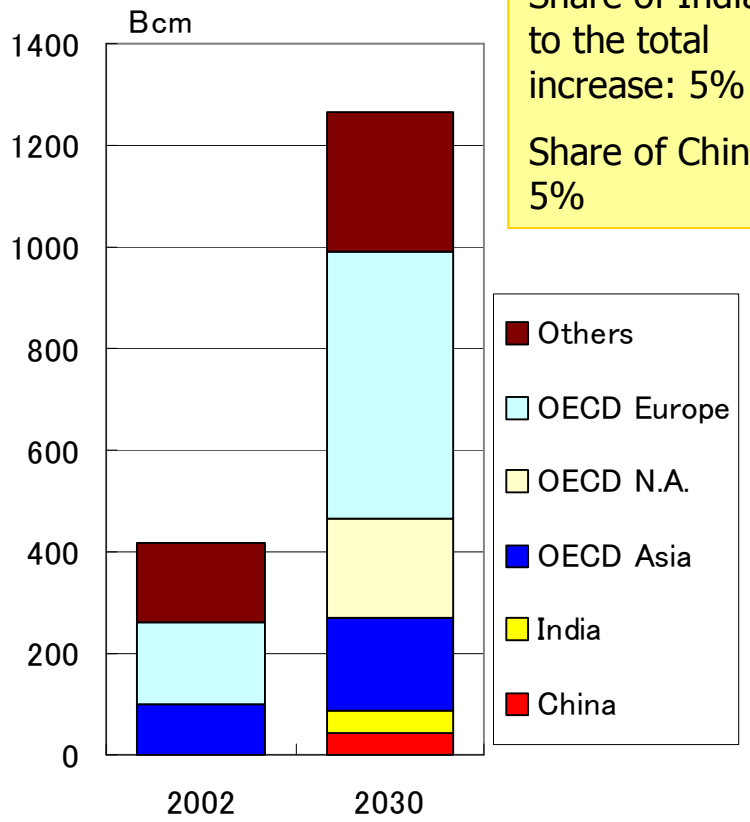
Oil Trade



Share of India to the total increase: 10%

Share of China: 24%

Gas Trade

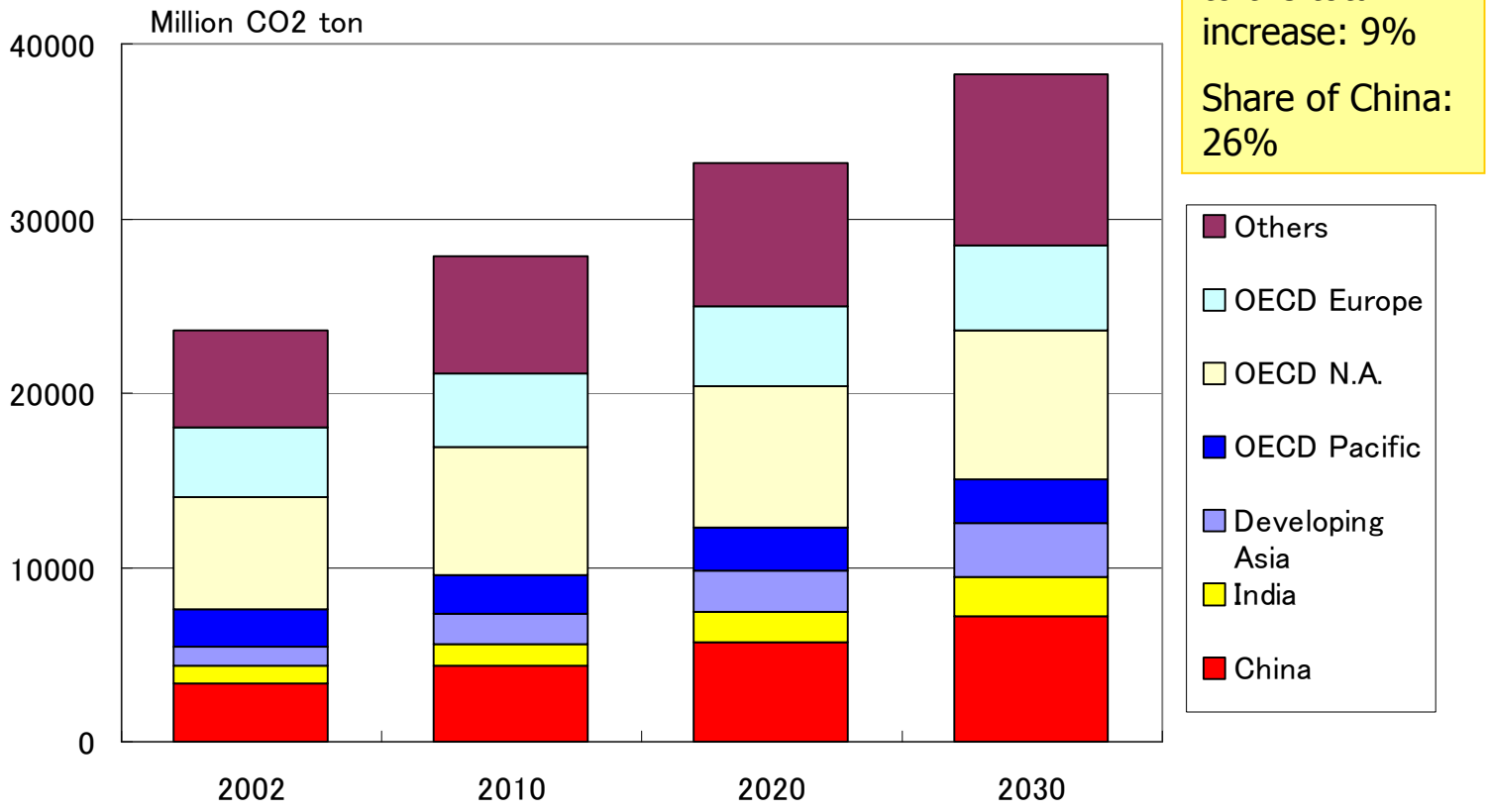


Share of India to the total increase: 5%

Share of China: 5%

(Source) IEA, "World Energy Outlook 2004"

Position of India in CO2 Emission



Share of India to the total increase: 9%

Share of China: 26%

(Source) IEA, "World Energy Outlook 2004"

Challenges in Energy Supply and Demand

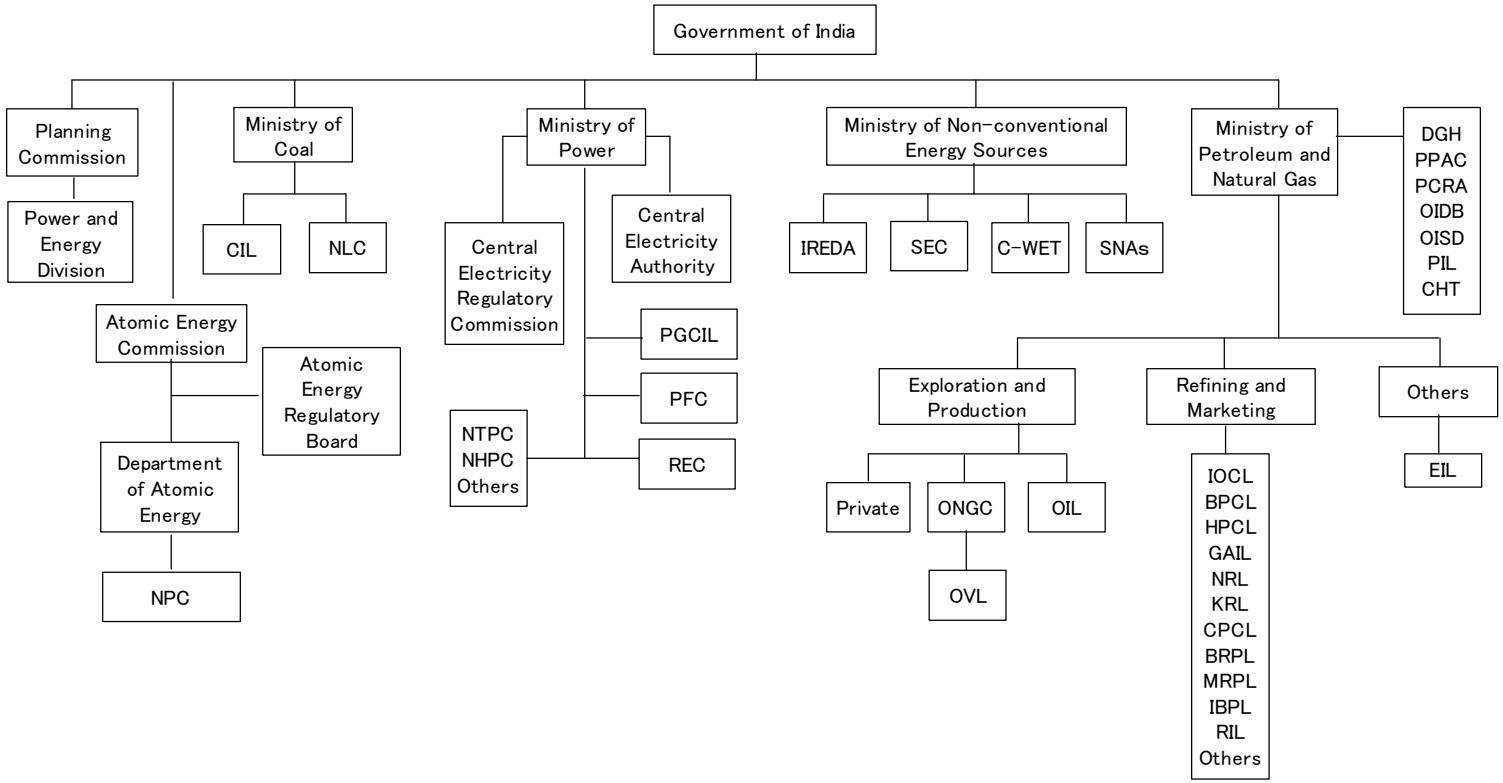
- Energy demand (especially commercial energy consumption) and environmental load increase due to economic growth and increase in income.
- Energy efficiency does not reach the international standard.
- Crude oil import increase due to increase in petroleum product demand and export thereof, and the stagnation of domestic crude oil production.
- With the increase in refinery capacity, the country is shifting from an importer to an exporter of petroleum products.
- Coal and gas imports increase because of supply lagging behind demand.
- Blackouts are occurring frequently due to the shortage of electricity supply.
- Energy demand is expected to expand in the future as well, and restrictions on demand growth and ensuring of supply are necessary.

Authorities in India in Charge of Energy Policy

- PC：Planning Commission
  - Planning commission to set, execute and administrate the Five-Year Plans, which are is the fundamental policies for the national economy including energy policy.
- Central government ministries by energy sources
  - Ministry of Petroleum and Natural Gas (MoPNG), Ministry of Coal (MoC), Ministry of Power (MoP), Ministry of Non-conventional Energy Sources (MoNES), Department of Atomic Energy (DAE)
  - Regulatory agency (DGH: Upper stream for oil and natural gas, CERC: Electricity)
- State government agencies
  - State Electricity Board (SEB), regulatory agency (SERC)

(Source) Teri "Energy Data Directory & Yearbook (TEDDY) 2004/05" and others

Administrative Organization for Energy in India



BPCL: Bharat Petroleum Corporation Ltd
BRPL: Bongaigaon Refinery and Petrochemicals Ltd
CHT: Centre for High Technology
CIL: Coal India Ltd
CPCL: Chennai Petroleum Corporation Ltd
C-WET: Centre for Wind Energy Technology
EIL: Engineers India Ltd
GAIL: Gas Authority of India Ltd
HPCL: Hindustan Petroleum Corporation Ltd
IBPL: Indo-Burma Petroleum Company Ltd
IOCL: Indian Oil Corporation Ltd

IREDA: Indian Renewable Energy Development Agency
KRL: Kochi Refineries Ltd
MRPL: Mangalore Refinery and Petrochemicals Ltd
NHPC: National Hydroelectric Power Corporation
NLC: Neyveli Lignite Corporation Ltd
NPC: Nuclear Power Cooperation
NRL: Numaligarh Refineries Ltd
NTPC: National Thermal Power Corporation
OCC: Oil Coordination Committee
OIDB: Oil Industry Development Board
OIL: Oil India Ltd

OISD: Oil Industry Safety Directorate
ONGC: Oil and Natural Gas Corporation
OVL: ONGC Videsh Ltd
PFC: Power Finance Corporation
PGCIL: Power Grid Corporation of India Ltd
PIL: Petroleum India International
PTC: Power Trading Corporation
REC: Rural Electrification Corporation
SEC: Solar Energy Centre
SNAs: State Nodal Agencies

(Source) Teri "Energy Data Directory & Yearbook (TEDDY) 2004/05" and others

Basic Energy Policy in India

- **Policy in the Tenth Five-Year Plan (2002)**
  - **Increase in the production of coal and electricity**
  - **Enhancement of domestic exploration and development of oil and gas (including CBM)**
  - **Acquisition of overseas assets and resources**
  - **Promotion of structural reform and deregulation of the energy sector**
  - **Improving energy efficiency by DSM**
  - **Improvement of environment contamination measures**

Comprehensive energy approach is necessary

- **Draft for the Eleventh Five-Year Plan (2005)**
  - **Placing a panel of experts for setting comprehensive energy policy**
  - **In particular, focus on improving the efficiency of energy usage**

Security Measures on Oil and Natural Gas
Authority: Ministry of Petroleum and Natural Gas (MoP&NG)

(i) Enhance efforts on developing oil (including natural gas) within the country and abroad
→ In November 2004, MoPN&G organized the "Standing Advisory Committee on Oil Diplomacy for Energy Security" together with the Ministry of Foreign Affairs.

(ii) Ensure imports of oil and natural gas → Diversification of supply sources and routes

(iii) Promotion of diplomacy in "energy cooperation" → Enhancement of relationships with oil-producing countries and improve relations with neighboring countries

(iv) Adoption of oil alternative energy
→・ Including bio-fuel for transportation fuel/promotion of introducing CNG cars
・ Supplying electricity in rural regions by renewable energy/coal gasification power generation

(v) Make Efforts to improve energy efficiency (energy-saving)

(vi) Establishing system of national strategic oil reserves
→ Organize an administrative company "Indian Petroleum Strategic Reserves Ltd.," and finish selecting sites for stockpiling
・ First phase: 15 days (5 million tons of crude oil)

(vii) Consider stockpiling in private sectors based on the "Petroleum Strategic Reserves Law" (30 days)

Policy on Oil and Natural Gas
(1) Domestic Upstream Development

- Major players: ONGC, OIL, Reliance
- The 8th 5 Year Plan (1992-96): Target on proved reserve accumulation
  - Promotion in the form of a joint project between the ONGC and OIL → had no favorable effect
- 1997: Decision on adopting NELP (New Exploration Licensing Policy)
  - Eliminated the preferential treatment for the government-managed oil company, and opened the domestic exploration and development sector to foreign and private companies.
  - Offered incentives to companies that participated (period of exploration, tax benefits)
  - Implementation of five NELP tender rounds until 2005
    - 109 mining claims are awarded, vs. 21 mining claims (1992-97)
    - Most foreign companies took the form of consortium with domestic companies (Cairn Energy (UK), Niko Resources (Canada), etc.). However, there were some discoveries in awarded mining claims

(* Refer to slides 14 and 17 for domestic production of crude oil and natural gas)

Outlook of Crude Oil and Natural Gas Production in India (The Tenth Five-Year Plan: FY2002-FY2006)

◆Crude Oil

(Million tons)

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	Average annual growth rate
ONGC	24.71	25.90	25.99	26.38	26.19	25.56	−0.3%
OIL	3.18	3.50	3.60	3.75	3.85	4.00	3.4%
Other	4.14	3.68	3.63	4.50	4.44	4.41	4.6%
Total	32.03	33.08	33.22	34.63	34.48	33.97	0.7%
Actual	32.03	33.04	33.37	33.98			

◆Natural Gas

(Million CM/day)

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	Average annual growth rate
ONGC	65.87	65.50	63.37	62.22	58.83	57.03	−3.4%
OIL	4.43	6.01	6.41	6.61	7.69	7.80	6.7%
Other	11.11	15.05	20.76	35.01	35.47	38.25	26.3%
Total	81.41	86.56	90.54	103.84	101.99	103.08	4.5%
Actual	81.41	86.00	87.56	87.06			

Source: TERI Energy Data Directory & Yearbook 2004/05, "Basic Statistics on Indian Petroleum & Natural Gas" by MoPNG

(2) Overseas Upstream Development

- **Major players: ONGC Videsh (OVL), IOC-OIL, Reliance**
- **Production goal abroad**
  - **The Tenth Five-Year Plan (FY2002-FY2006):**
    - **Crude oil 5.2 million tons (FY2004 actual: 3.71 million tons)**
    - **Natural gas 4.94Bcm (FY2004 actual: 1.37Bcm)**
    - **Area: Vietnam, Russia, Syria, Iran, Iraq, Sudan, Libya, Angola, Brazil and others (15 countries in total)**
  - **Governmental target for FY2010: 20 million tons of crude oil and natural gas**
- **Ordinance by MoP&NG (Jan. 2003)**
  - **Instruct to obtain interests abroad by the consortium of domestic energy companies → Avoid the clash of interests due to competition among Indian companies**

Upstream Development Abroad: Projects

Entered market	Indian companies involved	Project/claims (share of interests)	State
Vietnam	ONGC Videsh (OVL)	Nam Con Son (40%)	Production (natural gas)
Myanmar	OVL, GAIL	Block-A1	Exploration
	Essar	Block-A2	Awarded May 2005
Russia	OVL	Sakhalin I	Development/production
Syria	OVL, OIL	Block-24	Exploration
	OVL（& CNPC）	AFPC interests (17%)	Production
Iran	OVL, IOC, OIL	Farsi offshore Block	Exploration
Iraq	OVL	Block-8	Exploration
Qatar	OVL	Najwat Najem	Awarded March 2005
Oman	RIL	Block-18 (100%)	Awarded March 2005
Sudan	OVL	Greater Nile Oil (25%)	Production
Libya	OVL	NC-188/189	Exploration
	IOC-OIL	Block-086 (18.4%)	Awarded January 2005
Angola	OVL	Greater Plutonio Block-18	Exploration
Egypt	OVL	Block-6	Awarded March 2005
Nigeria	ONGC-Mittal	Block-285,279	Awarded May 2006
Brazil	OVL	BC10 Block	Exploration
Cuba	OVL	Block-25 and 7 other claims (30% each）	Awarded May 2006

(Source) Prepared from various materials including the website of OVL

(3) Downstream Sector

- **Oil refining (10 companies: 9 government-owned, 1 private, 7 of them also engaged in sales)**
  - **Refinery capacity (Mar 2006): 2,598,000 B/D (in 18 refineries)**
    - **Share of government-owned: 75%; share of private: 25%**
  - **Expansion plan of +2.13 million B/D by 2010, export-oriented**
- **Oil sales (10 companies: 7 government-owned, 3 private)**
  - **Sales amount (FY2004): 2,231,000 B/D**
    - **Share of government-owned: 85% (breakdown: IOC 43%, BPCL 19%, HPCL 17%)**
  - **Required to obtain sales license from the central government**
    - **In April 2002, licensees were granted to 6 companies including 3 private (1 foreign) companies.**
- **Oil transit PL (OIL, IOC, HPCL, BPCL, Petronet, Gail)**
    - **Crude oil (3,971km), petroleum product (7,013km), LPG (1,850km)**

(* Refer to slides 12 and 13 for the supply and demand of petroleum product)

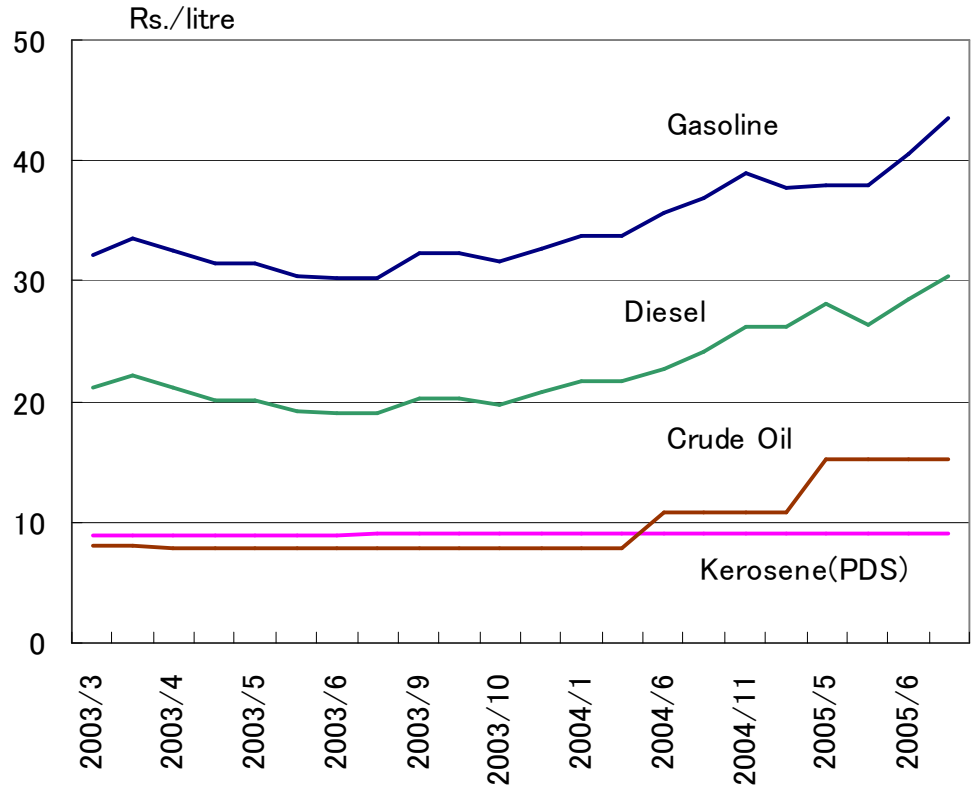
(4) Structural Reform and Deregulation of Oil Industry

- **Against the background of expansion in oil demand and crude oil import, the country tries to adopt the market mechanism in order to improve the efficiency of supply and promotion of foreign capital introduction.**
  - **Withdrawal of privatization plan of government-owned oil companies**
    - **Ruling in 2003 to stop the government sales of stocks of HPCL and BPCL**
  - **Liberalization of crude oil import/import and export of petroleum products (1998-)**
  - **Liberalization of petroleum products sales price**
    - **1997: Gradual abolition of Administered Pricing Mechanism (APM) and proposal of tax scheme review by the Strategic Planning Group on Restructuring of the Oil Industry**
    - **-2002: Liberalization of the price of products other than gasoline, diesel oil, kerosene and LPG**

(5) Price System for the Administration of Oil Products

- **Transition of price systems for petroleum products**
  - **April 2002: Abolition of price administration mechanism for petroleum products**
    - **Kerosene and LPG for kitchens by the government-owned company are subsidized until the end of March 2007 (originally planned to be abolished by the end of March 2005)**
  - **August 2002: Pricing system to reflect international market conditions (for gasoline and diesel) was permitted to 3 government-owned downstream companies**
  - **January 2003: Froze the above system according to the rise in international market price**
    - **Losses of government-owned downstream companies increased due to negative spread**
    - **Government requested to accept losses to 3 government-owned upstream companies**
  - **September 2005, June 2006: Government raised the price of gasoline and diesel to reduce the subsidiaries (no change for kerosene and LPG). Adequate price-raising was difficult under the administration of the coalition government (including the Communist Party).**
    - **Different tax rate by products and states was also not revised.**

Petroleum Retail Price at Delhi in India



(Note) The price of crude oil in India was calculated from the average value of the import basket price for the fiscal year (USD/barrel). PDS : Public Distribution System.
(Source) Estimated from "Report of the Committee on Pricing and Taxation of Petroleum Products" (2006) by the PC, the website of PPAC, and the website of the Ministry of Finance, India

(7) Natural Gas in Midstream and Downstream

- **Major player: Gail almost have a monopoly on the transport and sales sectors**
  - **Preparation of trunk line network: total length of 5,340km (+8,364km/10 systems)**
- **Increase in use of natural gas**
  - **Commercial use started in the 1960s**
  - **Transport from offshore gas field in western India to fertile plants increased due to the completion of the HBJ Line (2,300km) in 1986.**
  - **Consumption increased during The Seventh (FY1987-) and The Eighth Five-Year Plans.**
  - **Price regulation and consumption quota by the MoP&NG on gas produced by government-owned companies**
    - **Basket price link for four largest international heavy oil markets (excludes gas produced in NELP claim)**
  - **Promotion of LNG and PL plans from the perspective of gas supply**
    - **Comprehensive policy draft on LNG is formed (approval of 100% foreign capital, etc.)**

(* Refer to slide 17 for the supply and demand of natural gas)

(8) LNG Import Project

- **From the late 1990s, the government approved 12 projects for the prospect of increase in natural gas demand.**
- **Soar in LNG price also affected the progress of the LNG project.**
  - **Because the power price is controlled, gas procurable for customers is limited.**
  - **Capacity usage ratio of Hazira LNG Terminal and others remains low.**

Site	Project participants	Capacity	LNG supply	Remarks
Daheji	Petronet LNG	5→12.5	Qatar RasGas	Started commercial operation in Apr 04
Hazira	Shell/Total	2.5→5	Shell assets (Australia)	Started accepting LNG in Apr 05
Dabhol	Maharashtra SEB	2.5→5	(Oman, AbuDhabi)	In conference for restarting construction
Kochi	Petronet LNG	2.5	(Qatar)	Scheduled for completion in 08
Ennore	IOC/GAIL	2.5	(Iran)	BP withdrew in 04

Source: Prepared from various materials, the unit of capacity is "million tons/year"

(9) International PL Construction Initiative

- **The talks are facing difficulty in terms of price and route.**

Initiative	Investment	Current state
(1) Myanmar → Bangladesh → **India**	$ 1 billion	・Joint announcement of three-way meeting for agreement on business promotion was signed on January 13, 2005. Technology review panel was established. ・GAIL implicitly suggested a diverted route plan against the background of wheeling charge. The three countries restarted talks on construction in March 2006.
(2) Iran → Pakistan → **India**	$ 4.2 billion	・A part of the South Pars Gas Project. ・2,700km in total. Onshore route FS accomplished by BHP. ・Gazprom recommends the route via Pakistan waters. ・Talks between Iran and India face difficulty in terms of price.
(3) Turkmenistan → Afghanistan → Pakistan → **India (TAP)**	$ 2.5 billion (to Pakistan)	・1,680km in total. ・Agreement made between the three countries in December 2002 on implementing FS with the support from ADB (implementation completed). ・In May 2006, Indian Cabinet decided to participated.

Source: Prepared from various materials

Coal Policy
Authority: Ministry of Coal (MoC)

- **Major players: CIL, SCCL, in-house consumption by private companies**
  - **Production share (FY2004): CIL (85%), SCCL (9%)**
- **Supply and demand of coal**
  - **Exploration of coal resources is limited to government-owned companies, and participation of private/foreign capitals into government-owned coal quarries is not allowed.**
  - **Coal production plan: PC decides upon establishing the Five-Year Plan**
  - **Coal price was deregulated by the Ordinance on Coal Quarry Administration (2000).**
- **Due to entry regulations, planned production and quotas, coal supply lags behind the increase in demand, and import is increasing rapidly, mainly in southern and western areas.**

(* Refer to slide 16 for the supply and demand of coal)

Electric Power Policy
Authority: Ministry of Power (MoP) and others

- **Major players: Power generation/transmission public corporations, private companies**
  - **Generated power is supplied as wholesale power to the SEB.**
  - **SEB: Controls about 60% of power generation and nearly 100% of power distribution**
- **Structural change**
  - **Private-sector entry: Power generation (1991), power transmission (1998, no actual cases)**
  - **2003 Electricity Law: Power generated by private sector permitted to be sold to end customers, partition of SEB (generation, distribution, transmission and trade)**
  - **2005 national electric power policy: Supplying electric power to all households, resolution of supply shortage**
- **Due to the unreasonable rate system and high power distribution loss, introduction of private investment did not progress. Electric power supply shortage has not been resolved.**
  - **Shortage rate (2004): 7.3% (electric energy), 11.7% (peak power)**

(* Refer to slide 18 for electricity power supply and demand)

Nuclear Power Policy

Authority: Department of Atomic Energy (DAE)

- **Major players: NPC (public corporation for nuclear power development), research institutes**
  - **NPC: Exclusively controls the construction and operation of nuclear power generation facilities**
- **Development policy**
  - **Promotes R&D since the foundation of the country in 1947, and utilizes domestically-produced thorium.**
  - **Refuses to sign NPT in 1968, and goes on with self-development policy by conducting nuclear test in 1974. (Out of 15 operating facilities, 12 are domestic PHWR.)**
    - **Output per one facility is smaller than developed countries: 170-540 thousand kW installed capacity**
  - **Agreeed with US in 2005 on cooperation for consumer use, and accelerated the development.**
  - **Expands installed capacity to 20 million kW by 2020 (3.92 kW as of the end of 2005)**

Energy Conservation Policy
Authority: BEE under MoP, PCRA under MoPNG

- BEE (Bureau of Energy Efficiency): Enforcement and promotion of Energy Conservation Law
- PCRA (Petroleum Conservation Research Association): Development/diffusion of energy conservation

- **2002: Enforcement of Energy Conservation Law**
  - Establishment of BEE
  - Specifying energy-intensive industries, and impose the duty of evaluation reports
  - Establish energy funds within the state governments and conduct support measures
- **While the amount of energy that can be saved is potentially large, there are no incentives to save energy under the controlled price system.**

Renewable Energy Policy
Authority: New Ministry of Non-Conventional Energy Sources (MoNES)

- **Promotes the adoption of renewable energy as a measure to ensure the security of energy and measures for villages without electric power supply**
  - **Adoption policy: various supporting measures, preferential measures for the private sector and foreign capitals, etc.**
  - **Goal for power generation adoption: The 10th 5-Year Plan (-2007): 3075MW**
    - **Wind power adoption exceeded the goal of 1500MW (Mar 2006：5200MW)**
  - **Bio-fuel**
    - **E5: Started adoption in nine states in 2003 (cuts in commodity tax). Expansion of the supplied region (to throughout the country) and upgrading to E10 are planned. Competes with general demand due to the limitation of production.**
  - **CNG cars: Used mainly in large cities and public transportation systems (250 thousand cars)**
- **Abundant potential resources such as solar power, wind power, water power, biomass, etc. Technology for development is also prepared domestically. Improvement of competitiveness and preparation of infrastructure will be the tasks for full-fledged diffusion.**

Environment Policy
Authority: Ministry of Environment and Forests (MoEF)

- Countermeasures for air pollution that is growing into a serious problem
  - Power generation sector
    - Limitation of using coals of high ash content for coal-fired thermal power
    - Shift to natural gas and recyclable energy
  - Transport sector: Quality regulation on fuel oil
    - 2005: EURO3 applied for gasoline and diesel in 11 major cities. EURO2 is applied in other cities (2010: EURO4 will be applied in 11 major cities)
- Global environmental measures: Ratified Kyoto Protocol in August 2002
  - Established the National CDM Authority (Dec 2003)
  - Approves CDM projects of high novelty in various fields
    - 232 cases approved domestically, 25 cases registered in CDM board (as of February 2006)
    - Water power, wind power and agricultural waste power generation, energy-saving in the fields of coal power generation and industrial fields
    - There are also skeptical views on the sustainability of projects

External Policies on Energy

- Omnidirectional energy diplomacy
  - To neighboring countries: Developed line of communication since the establishment of Shingh administration
  - To oil-producing countries: Holds round table meetings for talks between energy producers and consumers
  - To US: Enhance cooperation in the fields of alternative energy and nuclear power
  - To Russia: Promote cooperation in non-military nuclear power development
  - To China: Seek energy cooperation in a broad range of fields
    - Exploration and refinement of oil, petroleum chemistry, PL, R&D, diffusion of bio-fuel
  - To ASEAN: Look East Policy. Agreed upon cooperation in maritime security and energy fields. Free trade talks.
  - Participation in APP: Vice chair the Coal/Iron and Steel TF
    - Strong interest in technical development collaboration

External Policies on Energy (Contd.)

- **Relation with Japan in the field of Energy**
  - **Relationship between the two countries were not so close compared to those with other countries such as China.**
  - **However, India is located at the key junction of the sea lane connecting Japan and the Middle East.**
  - **By achieving high economic growth through economic deregulation and the development of ITC industries, international interest towards India is rising.**
  - **January 2005: India suggested energy cooperation between the two countries**
  - **April 2005: Prime Minister Koizumi visited India and signed the joint Japan-India communique**
  - **September 2005: The two countries agreed upon comprehensive energy cooperation**
    - **Participation in exploration and development in India, joint exploration and development in a third-party country**
    - **Transfer of information and experience on energy consumption and oil stockpiling**
    - **Joint research on measures for the stabilization of the Asia oil market**

Challenges for Energy Policies

- Energy conservation is not progressing for reasons such as the price control system of energy and lack of effective energy conservation policies, while demand is increasing.
- Although India intends to introduce private and foreign capitals, crude oil production is unchanged and crude oil import is increasing.
- Oil refining capacity increased with market deregulation, and shifted from a petroleum product importing country to an exporting country
  - However, there is a financial loss in downstream companies, while companies in the upper stream support subsidies
- There is inefficient investment in the development, production and transport of coal and gas, and due to pressure in supply and demand, coal and gas import increased.
  - However, due to the LNG price rise, progress of the LNG project may also be affected.
- Investments do not increase because of controlled price, and electricity supply shortage is unsolved.
- Promotion of investment by adopting the market price system and demand restraint are indispensable for solving the energy supply shortage.
  - However, adjustment with countermeasures for poverty is not easy, and it is hard to realize.

Summary and Implication

- **Expansion of energy demand and import should continue due to economic growth and population increase.**
- **The importance and influence of India in the international energy market are rising.**
  - **Accurate and timely grasping and analysis of information on the energy market and energy policies of India are pressing tasks.**
  - **The challenge for Japan is how to face India in the international energy market.**

Summary and Implication (Contd.)

- **Energy security issue and relationship with India**
  - As linkage in the energy market is intensified, India overcoming the vulnerability in terms of energy security shall contribute to enhancing the energy security in the region and the entire world. On the other hand, it can be the cause of instability for the region and the entire world, depending on the movement in India.
  - The relationship with Japan is not so close in terms of economy and trade compared to China.
  - It is important to build recognition to pursue "common interests" for ensuring energy security.
  - It is necessary to continue and enhance the cooperation based on experiences of energy security policies.
  - Maintenance and expansion of communication/cooperation channels at the levels of business, experts and government will be necessary.
- **Energy market in India where scale expansion, opening-up and instability all exist simultaneously**
  - Chance vs. risk for Japanese companies
  - Comparative advantage and utilization of experience in technology are the important tasks.