



Energy Security: Indian Perspective

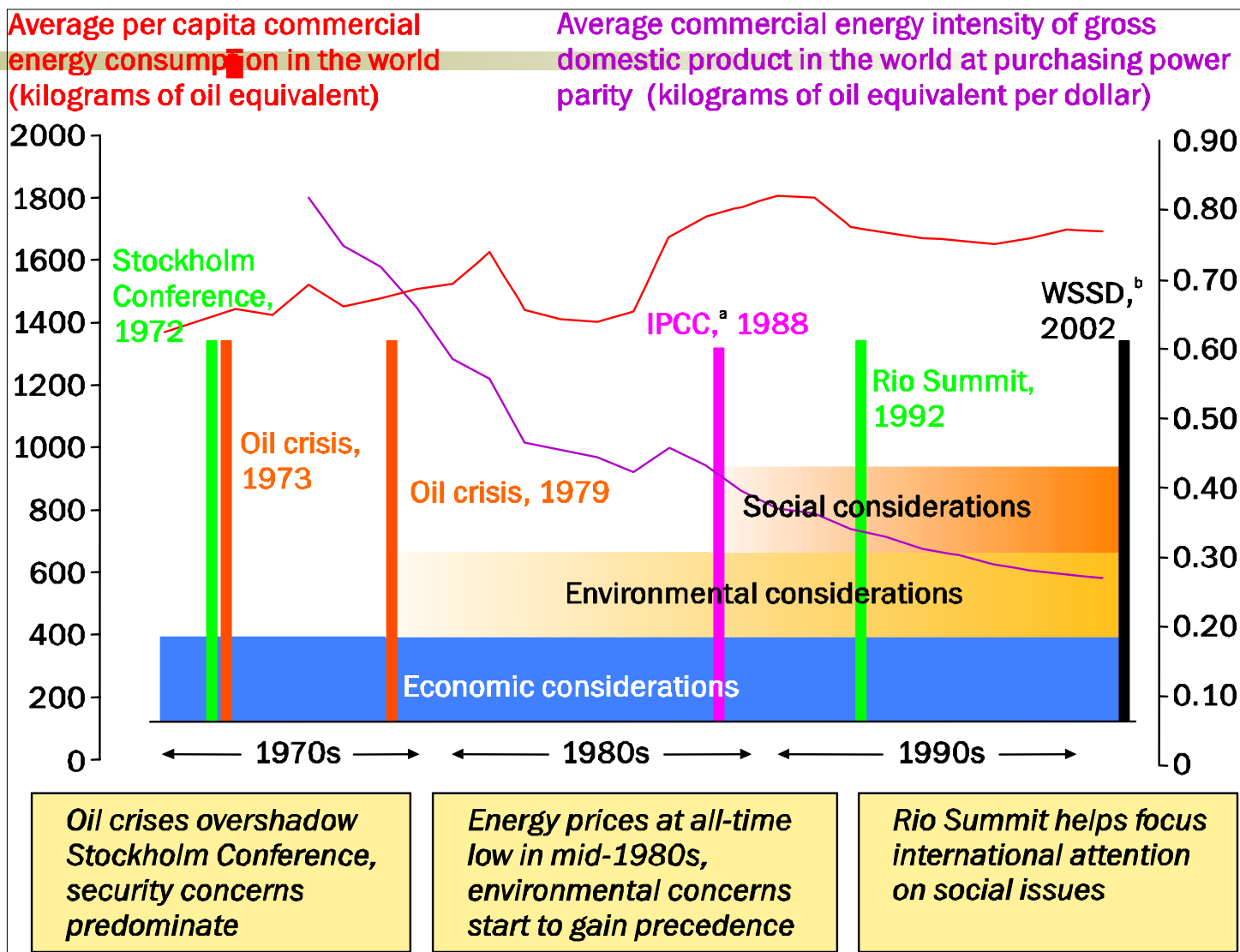
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Evolution of sustainable Energy Development



Source: Sustainable Energy Perspective for Asia , TERI 2002



Defining Energy Security

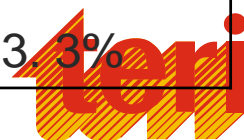
- Developing Efficient Energy portfolios
 - Oil security a very crucial aspect of Energy Security But There is more to Energy Security than Oil Security
- Universal access and consumption options
 - Security of supply critical
- Stable Prices
- Well developed Risk Management Tools
- Meeting global competition
- Meeting environmental goals : Both global

Energy Demand and Supply Projections: India

	2002/ 03		2006/ 07		2024/ 25	
	D	S	D	S	D	S
Coal MMt	340.1	341.3	460.5	405.0	669.0	450.0
Gas bcm	28.2	31.4	84.31	54.3	131.9	29.5
Oil MMt	97.7	33.0	134.5	34	256.7	80.0

Energy consumption in Asia – Global Shares

Country	Share in world Coal Consumption	Share in World Oil Consumption	Share in World Hydro Consumption	Share in World Gas Consumption
China	31.0%	7.6%	10.8%	1.30%
India	7.2%	3.1%	2.6%	1.20%
Indonesia	0.7%	1.5%	0.4%	1.40%
Japan	4.4%	6.8%	3.8%	3%
Malaysia	0.1%	0.7%	0.3%	1.10%
Philippines	0.1%	0.4%	0.3%	0.10%
Singapore	0.2%	0.9%	-	0.20%
Total Asia Pacific	50.7%	28.8%	23.1%	13.3%



Ever increasing Oil Demand

World Oil Demand (million barrels per day)

	2000	2010	2020	2030	Average annual growth 2000-2030 %
OECD total	44.8	49.6	54.0	57.6	0.8
China	4.9	7.0	9.4	12.0	3.0
India	2.1	3.0	4.2	5.6	3.3
Other South Asia	0.5	0.8	1.2	1.8	4.0
Middle East	4.1	5.2	6.3	7.7	2.2
Non-OECD	27.1	35.9	46.4	58.3	2.6
Bunkers and stock changes	3.1	3.3	3.6	4.1	1.0
Total demand	75.0	88.8	104.0	120.0	1.6

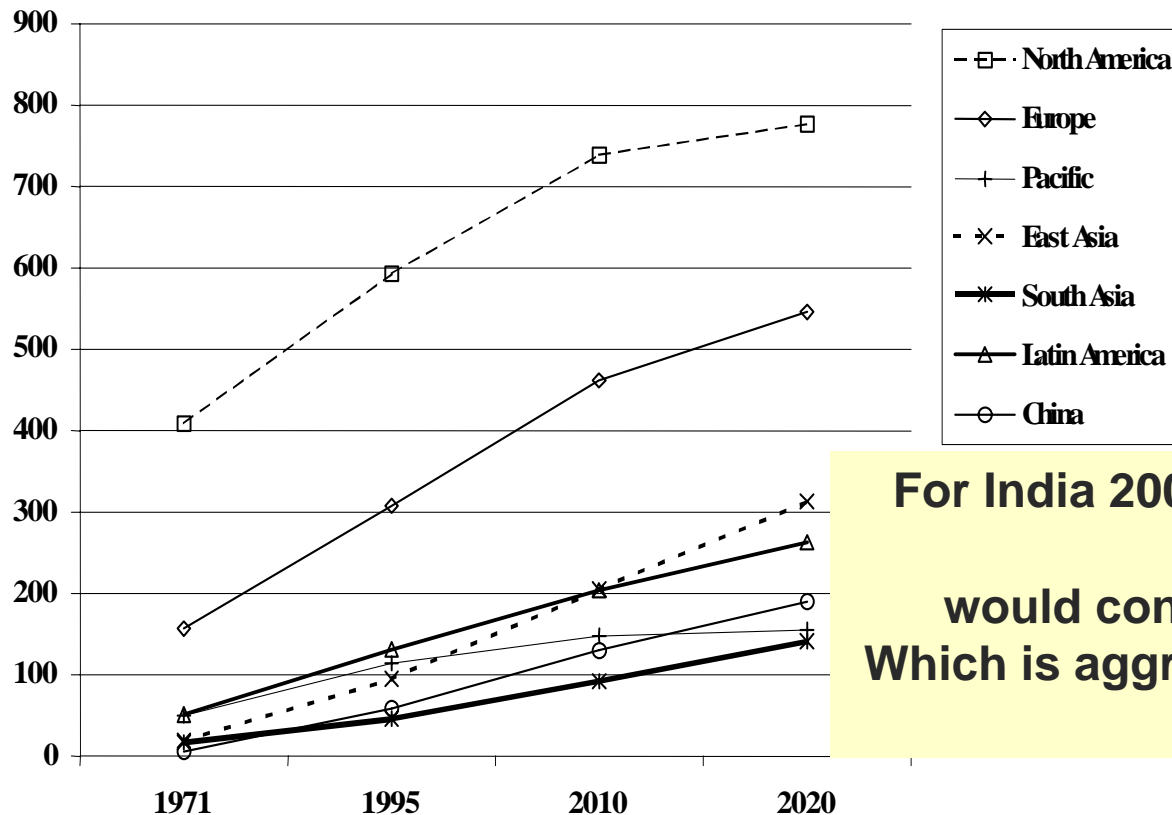
Source: World Energy Outlook IEA

- China to overtake Japan as the 2nd largest oil consumer in the world, Japan 3rd largest oil consumer
- India to emerge as the 5th largest oil consumer in the world



Increasing Transportation Energy Demand

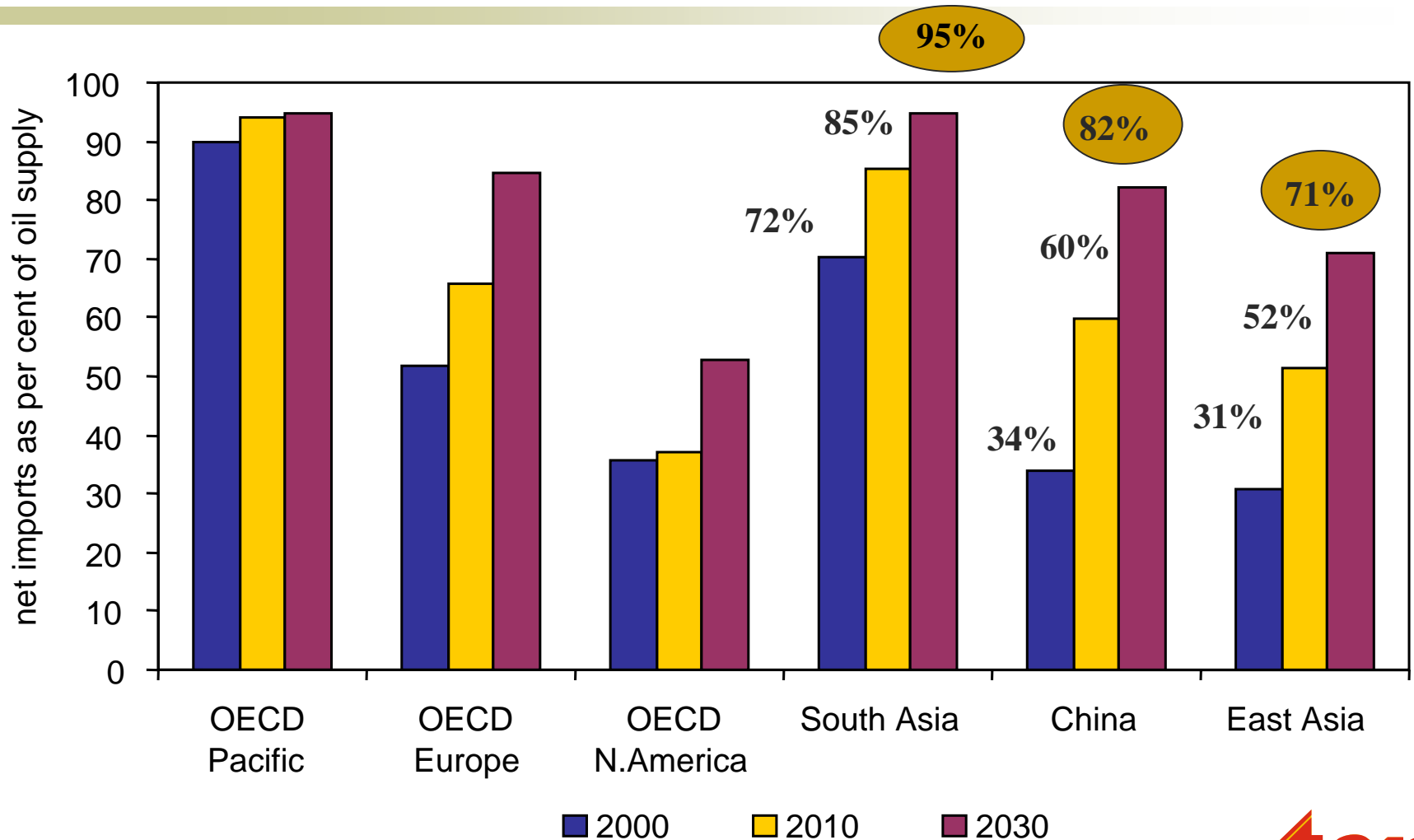
million tonnes of oil equivalent



**For India 200 million cars projected for 2030
would consume 160 MTOE per year
Which is aggregate of all forms of energy
in 2000!!**



Asia's Increasing Oil Import Dependency (%)



How to Enhance Energy Security??

- Securing long-term contracts with the key suppliers.
- Acquisition of producing assets or exploration acreage.
- Developing risk management tools.
 - Strategic Petroleum and Gas Reserves
- Initiatives to boost domestic supply
- Diversification of energy portfolios
 - Role of Gas
 - Developing Alternate Source of Energy
- Improving Energy Efficiency
- Increased Need for Regional Cooperation

Crude Imports : Diversifying sources

	1999	2003(est)
ME	52.4%	69.9%
Asia Pacific	5.3%	4.4%
A Basin	35.5%	15.7%
Others	6.8%	5.6%
S & C America		4.5%
	998kb/d	1.7 mmb/d

Strategic Reserves

- Emergency Response Mechanism against short term oil supply disruptions
- Size: 5 MMT of crude Oil Storage sufficient to meet 15 days consumption of crude oil
- Locations : 1 MMT (Vizag), 1.5 MMT(Mangalore), 2.5 MMT (Mangalore or nearby locations)
- International Energy Agency (IEA) requires oil importing member countries to hold stocks equivalent to 90 days of net imports.
- After setting the proposed strategic storage, India will have gross storage capacity in line with the IEA guidelines.
- the government of India also considering building of underground natural gas storage facilities

Equity Assets

- Acquisition of equity oil abroad another major strategies adopted to enhance the oil security of the country
- Active pursuit of equity oil by the State-run exploration firm ONGC's overseas investment arm, OVL (ONGC Videsh Ltd)
- OVL holds equity in oil and gas projects in Sudan, Russia and Vietnam and has interests in exploration blocks in Iran, Myanmar, Iraq, Libya, Syria and Sudan
- GOI aims to produce 20 MT/ annum of equity oil and gas abroad by 2010, with a long-term target of acquiring 60 MT/annum of equity oil and gas overseas by 2025
- GoI also considering equity in coalmines abroad.

Role of Gas

- Gas playing increasingly Important role in World Energy scene
- Development of LNG terminals
- Several options for international gas pipelines under consideration
- Measures to Develop gas infrastructure in the region

Development of Alternative Sources of Energy

- Renewable Sources of Energy
- Bio fuels e.g. ethanol blended petrol, bio diesel
- Hydrogen energy
- Coal Bed Methane

Regional Cooperation – India's Efforts

- Significant bilateral energy cooperation between India – Nepal and India – Bhutan
- Most of this in form of large hydro-power projects
- India keen to import ONGC's recent gas discovery in Myanmar through Pipelines

To sum up...

- Increasing importance of gas in world energy markets
- Revisit the significance of “clean coal” and “nuclear” ??
- Significant investment in energy infrastructure crucial
- Need to improve energy efficiency
- Efforts to boost development of alternative , cleaner technologies
- Regional cooperation to play a crucial role in enhancing Asia’s energy security

Thank you

