

MANAGING ENERGY DEMAND GROWTH IN EMERGING MARKET COUNTRIES

katherine.b.spector@jpmorgan.com



AGENDA

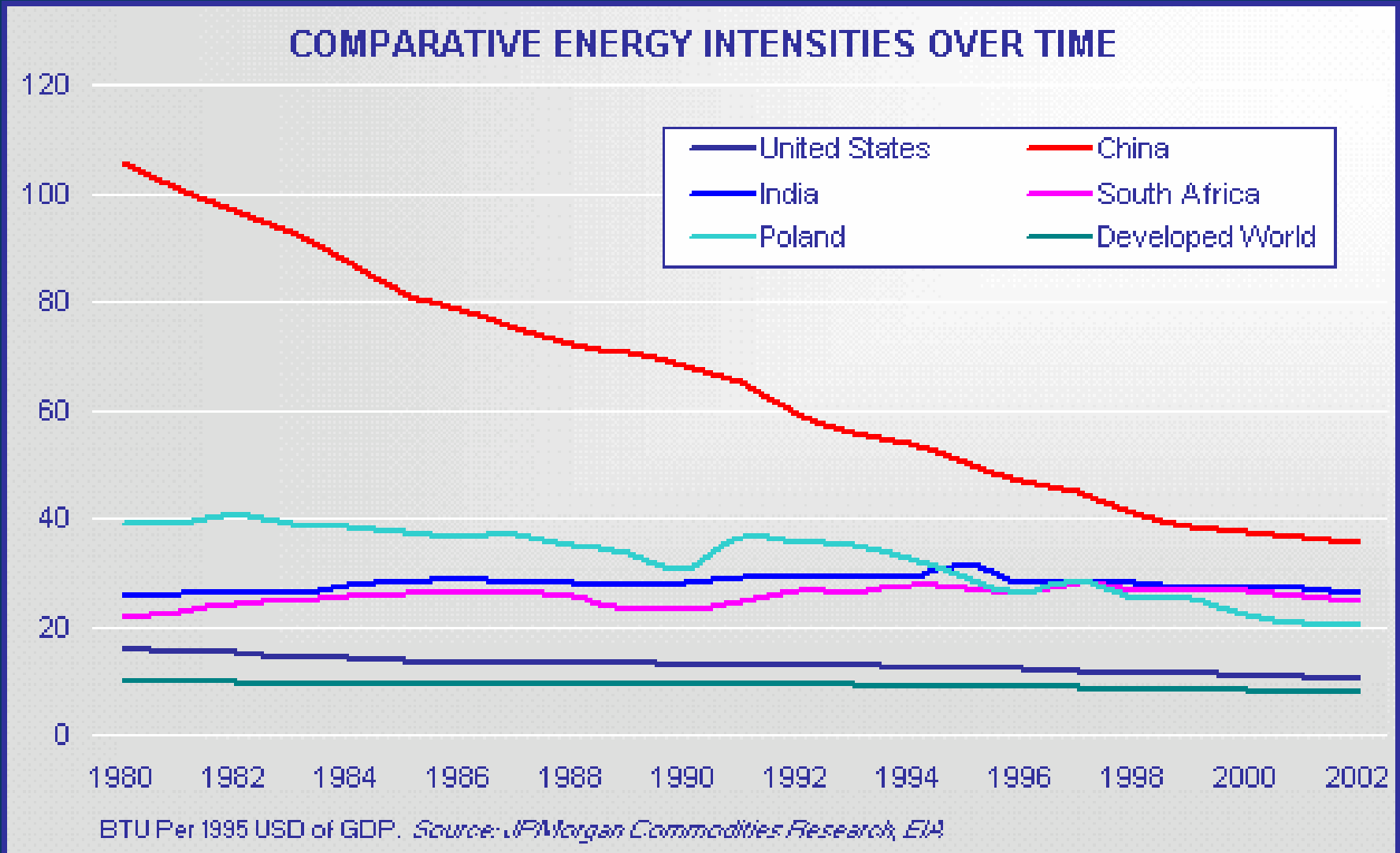
- Focus on China, India, South Africa
- Comparative energy intensities
- Demand growth and self-sufficiency
- Energy supply constraints versus distributional constraints
- Energy deficits as constraints to growth and FDI
- Government and industry strategies for managing energy demand growth

Opportunities For Energy Investment In the Non-OECD?

- Much of required investment will be in the non-OECD - China alone will require \$2.3 trillion, or 14% of global total over next 30 years (IEA WEO 2002)
- Less from government sources
- High risk, but potentially high return
- Positive demand growth outlook
- Government favor
- More conducive to some types of investment than the OECD - e.g. refineries and alternative energies

Comparative Energy Intensities

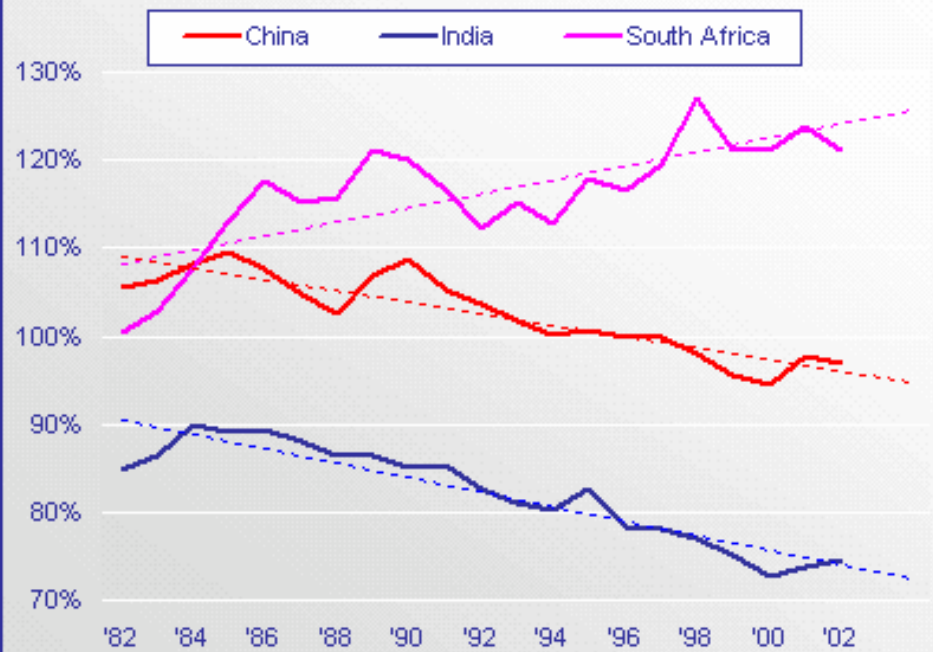
Emerging market countries make significant progress, but still trail developed world



Energy Demand Growth and Self-Sufficiency

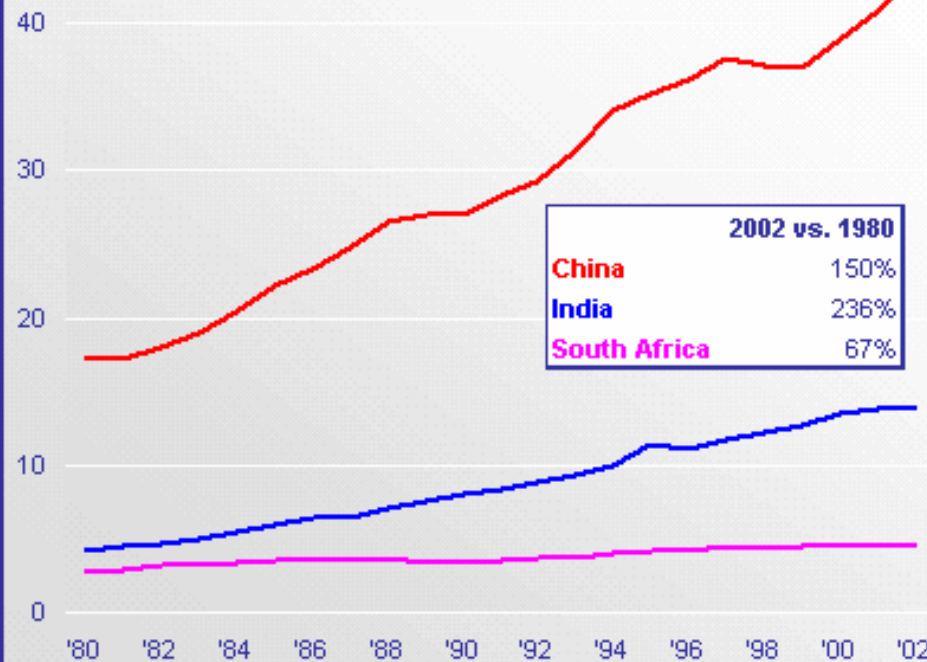
ENERGY SELF-SUFFICIENCY

Domestic Energy Production: Domestic Energy Demand



Source: JPMorgan Commodities Research, EIA

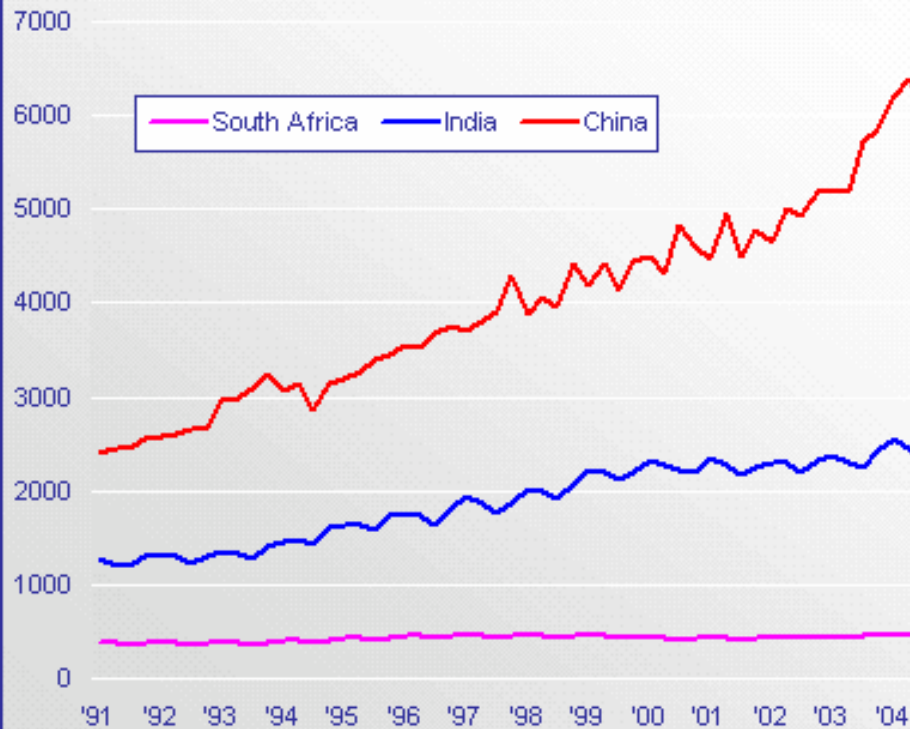
ENERGY DEMAND GROWTH



In quadrillion BTU. Source: JPMorgan Commodities Research, EIA

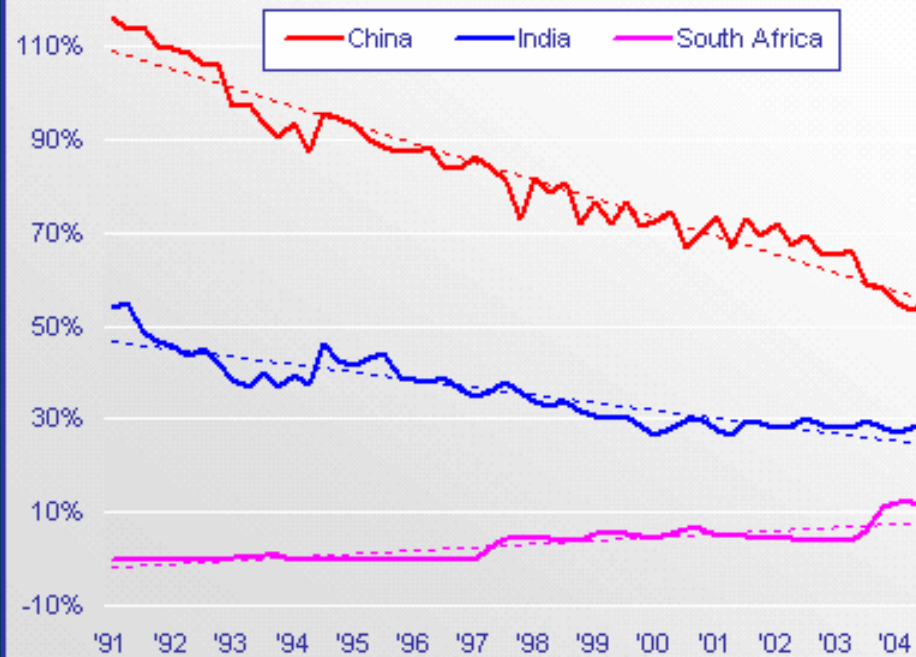
Oil Demand Growth and Self-Sufficiency

OIL DEMAND



OIL SELF-SUFFICIENCY

Domestic Oil Production: Domestic Oil Demand



Energy Supply Constraints Versus Distributional Constraints

Outright Supply Constraints:

Supply rations natural demand

Distribution Constraints:

Dispersed population + poor distributional infrastructure
limit consumption in certain regions or by certain
segments of the population

Why Should Governments Care?

- Access to reliable and affordable energy is a key development indicator, and key to keeping the population happy, particularly as disposable income and expectations rise post-democratization
- Energy security is increasingly viewed as a strategic imperative, particularly with respect to external dependency
- Reliable and affordable energy supply is key to maintaining economic growth
- A failure to supply reliable and affordable energy can seriously discourage foreign investment



Government Strategies for Managing Demand Growth and Securing Energy Supply

- Conservation mandates and demand side management
- New domestic generation, production, & distribution capacity
- E&P abroad, diversification of foreign sources
- Strategic stockpiling
- Alternative energies

Conservation Mandates/Demand Side Management

More Growth Friendly

- More stringent fuel standards for personal vehicles, improved road quality
- Efficiency standards for appliances
- Reduction in energy subsidies + Tax incentives for alternative energy development, energy efficiency and conservation measures

Less Growth Friendly

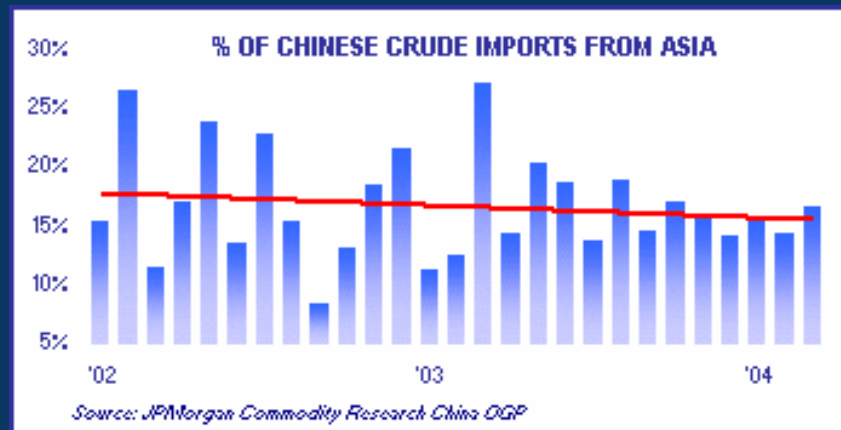
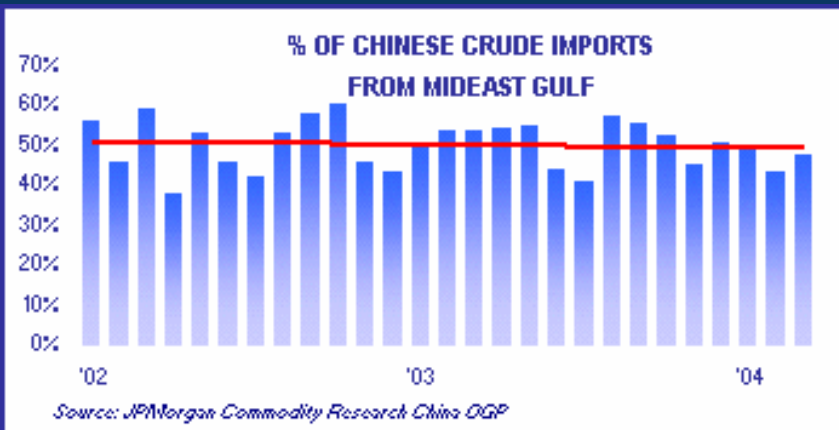
- Limiting industrial production to certain days of the week
- Forced shutdown of inefficient refining, generation facilities
- Blackouts/brownouts



New Domestic Generation, Production, and Distribution Capacity

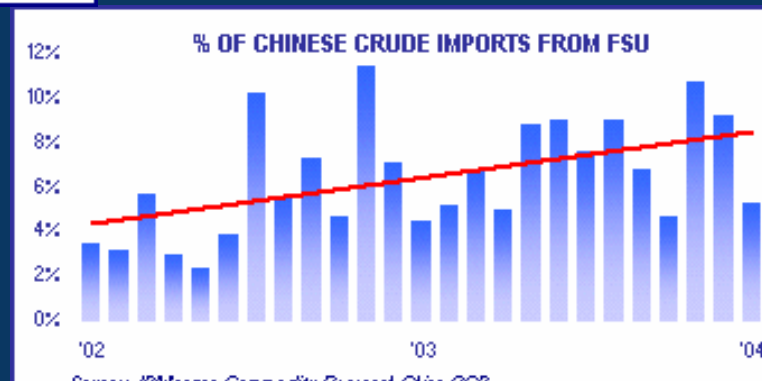
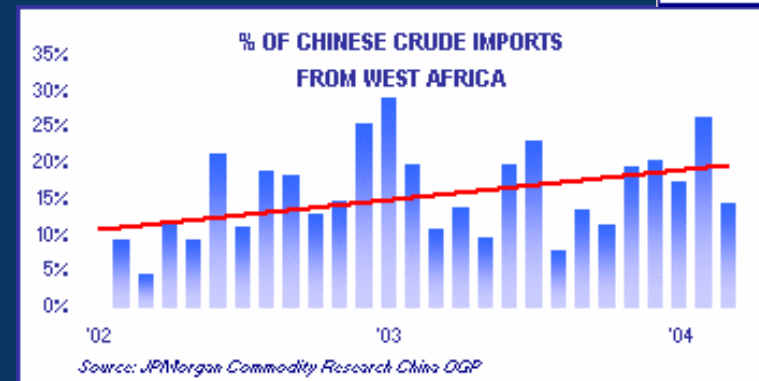
- New refinery capacity
- New power generation capacity
- Pipeline & tanker fleet investment
- Off-grid technology

E&P Abroad, Diversification of Foreign Sources



% CHINESE CRUDE IMPORTS FROM MAJOR REGIONS			
	2002	2003	2004td
Mideast	49.9%	50.9%	46.7%
Asia	17.3%	16.5%	15.5%
N. Africa/Med	9.3%	6.5%	8.0%
Atlantic Basin	20.7%	23.7%	28.3%
Americas	0.0%	0.8%	0.4%
W. Europe	4.9%	1.3%	3.2%
W. Africa	13.1%	16.5%	19.4%
FSU	5.6%	7.2%	6.7%
OPEC	39.6%	37.6%	33.8%

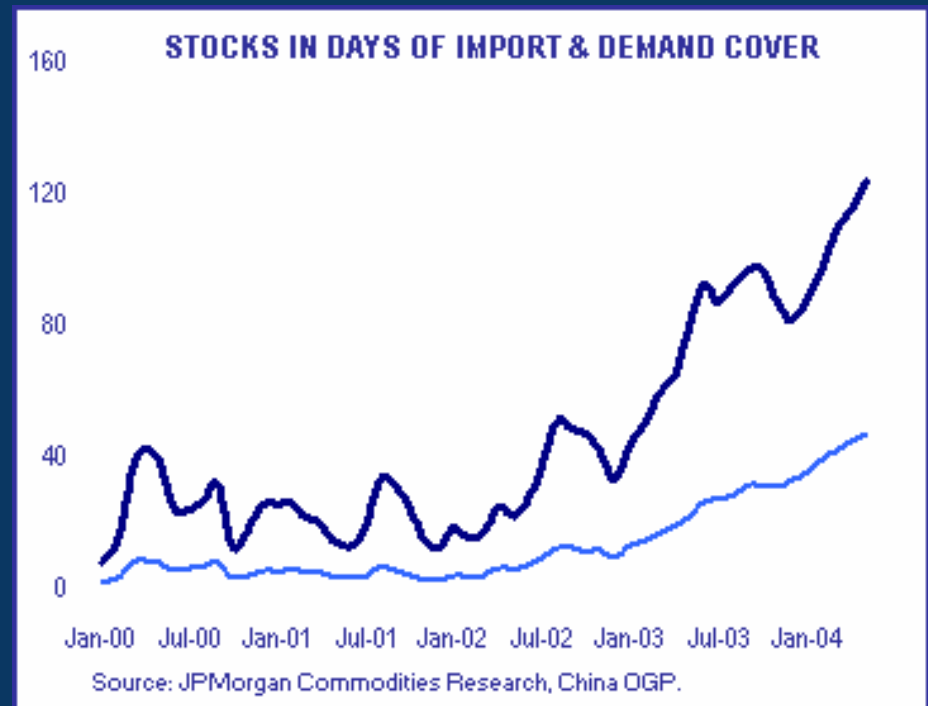
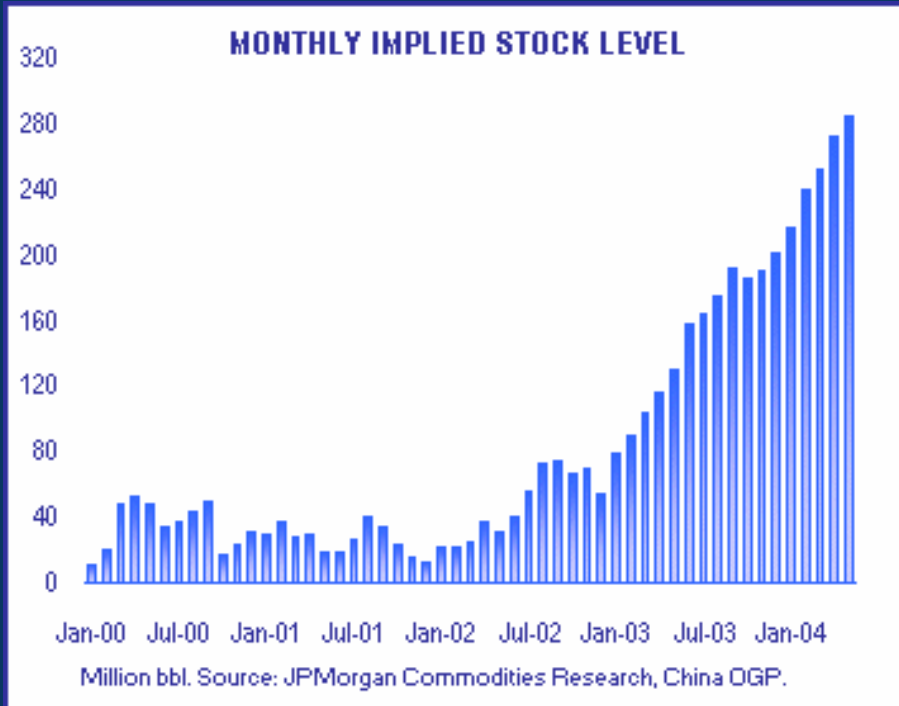
Source: JPMorgan Commodity Research, China OGP



Strategic Stockpiling

- China and India are both planning government stockpiles
- Government tanks are not yet complete, but there are strong indications that inventories are on the rise.

Implied Chinese Stockpiling



Alternative Energies

- In large countries with dispersed populations, expanding the grid is not necessarily the most efficient option for rural electrification.
- Renewable energy - e.g. solar, hydro, and wind - have found a foothold in China, South Africa, and India as a result.
- Many of these technologies are most effective for small-scale off-grid applications

