

Indian Energy Trends: The Climate and Development Challenge

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Agenda

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- Context of Climate Negotiations
- Indian Energy Trends
 - Industry
 - Transport
 - Residential
- Existing Indian Policies & their Impacts
- New Policies
- Needed Changes in Development Paradigm in India

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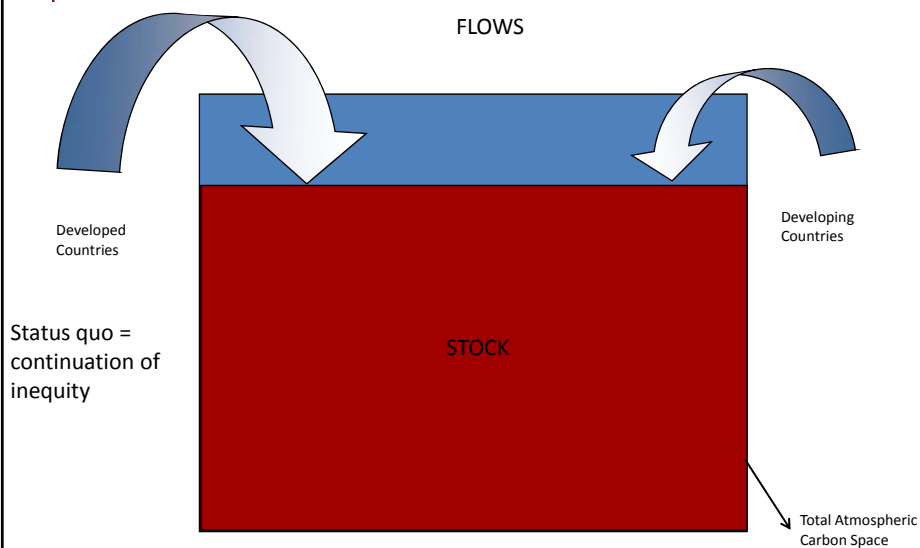
Global Warming – Unfair past, but India needs to Act..

- The OECD countries have used global commons disproportionately. It is leaving limited space for Global South to grow.
- OECD are not meeting even Kyoto commitments (most are still increasing their emissions)

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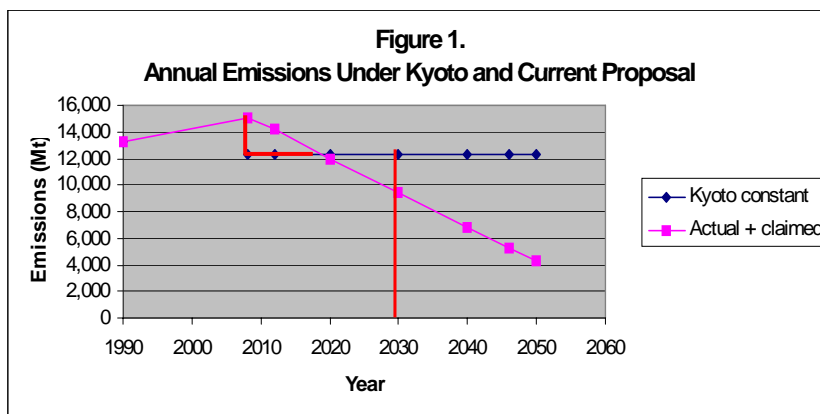
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Stock, Flows and Change in Flows



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Delayed reduction of flows by OECD restricts the space for the Developing countries



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The Climate Deadlock

- What is the US Stance
 - Point to change in flow and potential large flows (esp from China)
 - Countries like India and China must take commitments before US accepts targets
- What is India's Stance?
 - Annex I countries must take responsibility for Historical emissions. Any reduction will be with technology transfers and monetary funding from Annex I.
 - India has already taking action but is insufficiently recognized

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Insight

- What has India has done?
- How does Indian Energy trends compare with US, EU, China

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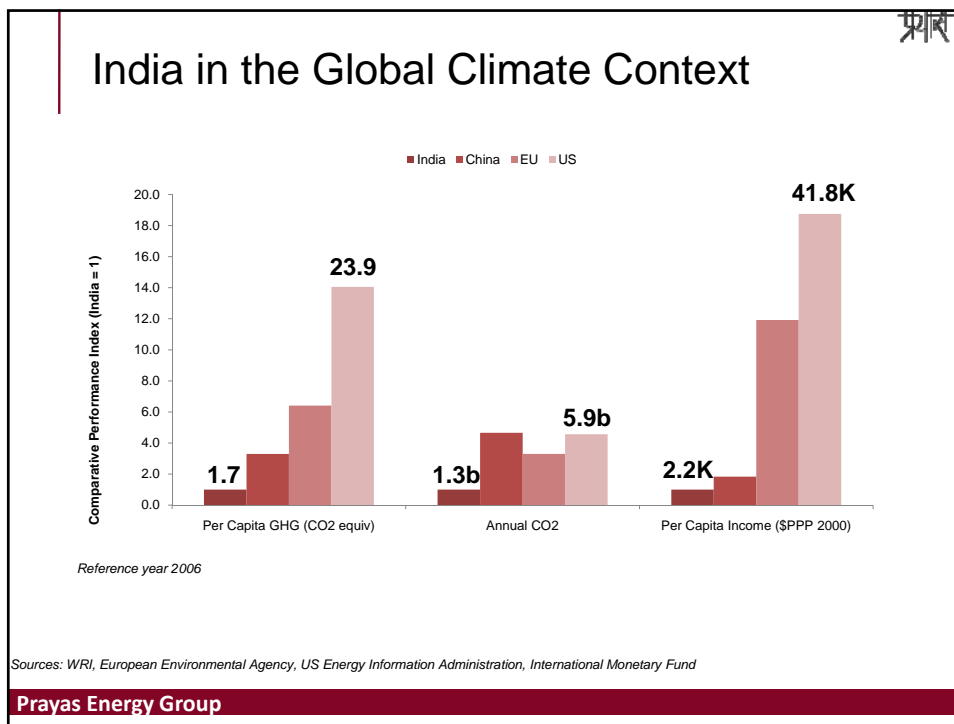
Energy and Development

According to the IEA, India's share would increase to 7 percent of global emissions by 2020.

	Emissions Share	Population Share
2005	4%	17%
2020	7%	18%

Source: International Energy Agency, Reference Scenario

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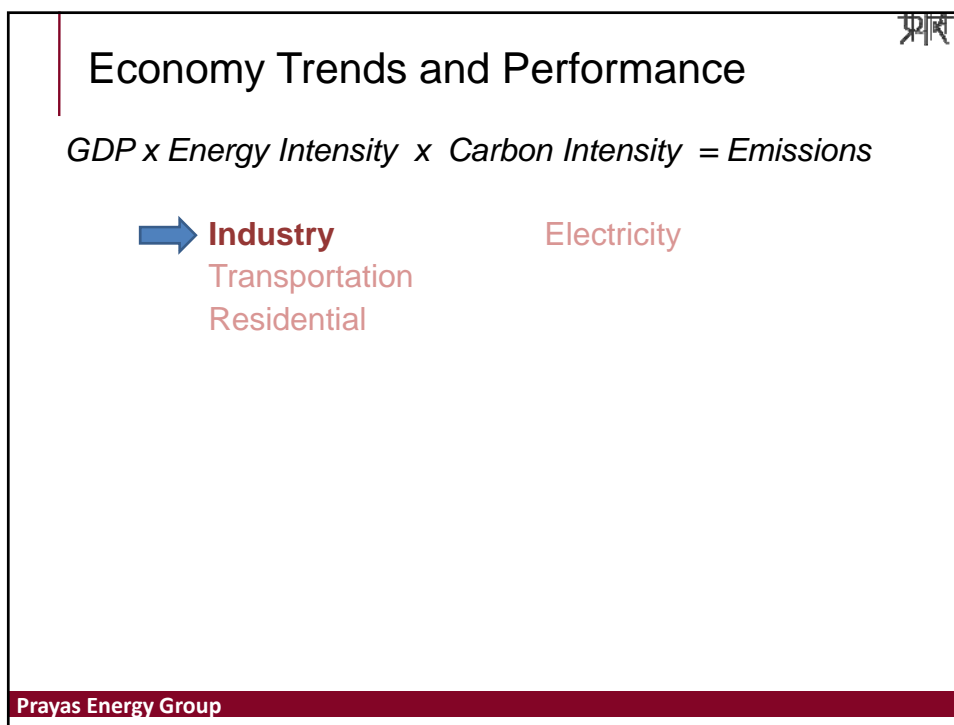
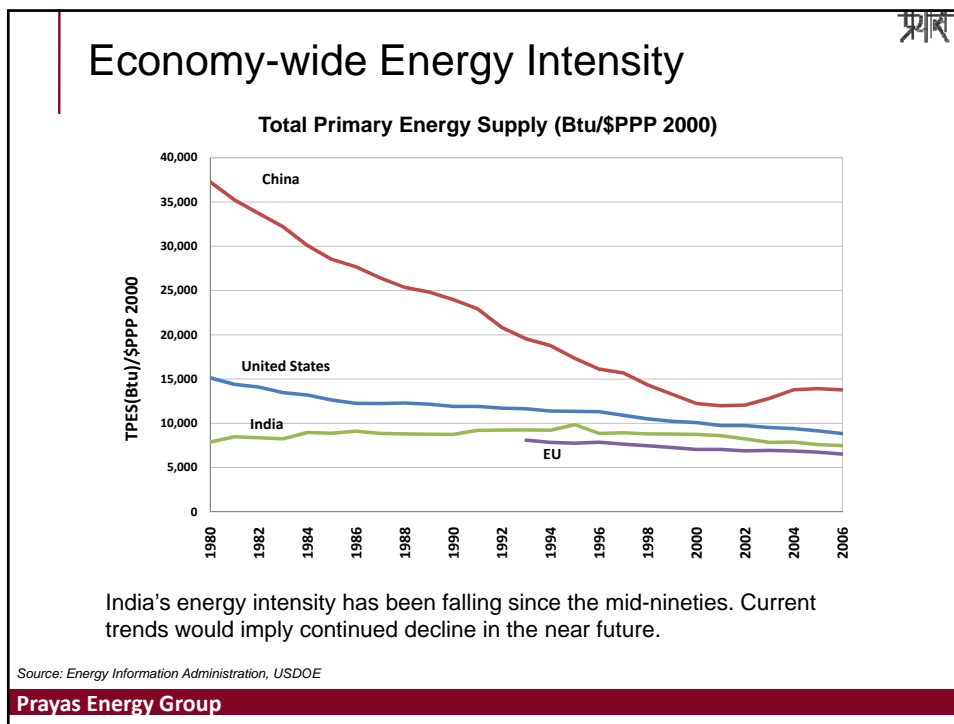
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Economy Trends and Performance

$$\text{GDP} \quad \text{Energy Intensity} \quad \text{Carbon Intensity}$$

$$\text{Income} \times \text{Energy / Unit of Income} \times \text{Carbon Emissions / Unit of Energy Produced} = \text{Emissions}$$

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Energy Intensity – Industry

Industrial growth (7% p.a between 2000 - 2005) has decoupled from its energy consumption growth (3% p.a)

Type of Industry	Energy Consumption in / ton (GJ/ton)	
	1990	2005
Iron and Steel	41.9	29.1
Cement	3.6	3.1
Ammonia	55.3	42.9
Aluminium	399.0	364.9
Pulp and Paper	35.0	24.0

Cement industry is the most efficient in the world in terms of electricity use.

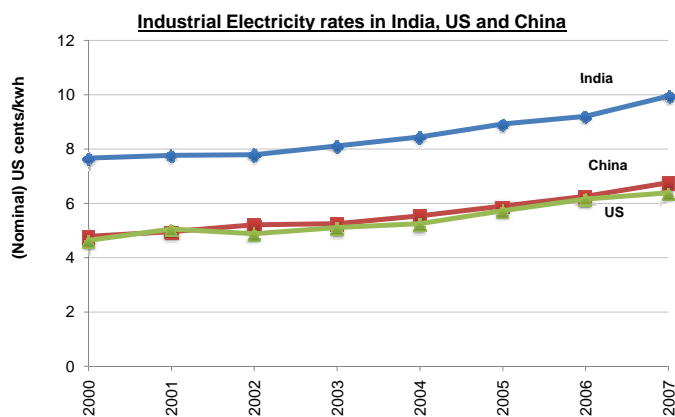
Source: Lawrence Berkeley National Laboratory, 2009

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Drivers of Industrial Energy Intensity

High industrial electricity rates encourage energy efficiency.



Source: US Energy Information Administration, Indian Planning Commission, Power Finance Corporation, Lawrence Berkeley National Laboratory

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Economy Trends and Performance

$GDP \times Energy\ Intensity \times Carbon\ Intensity = Emissions$

Industry

→ Transportation

Residential

Electricity

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Transportation Sector Energy Demand

Transport fuel demand growth is relatively low.

Transport Energy Demand

Year	United States	China	India
1999	27	5	2
2000	28	6	2
2001	28	6	2
2002	29	6	2
2003	29	7	2
2004	30	7	2
2005	30	8	2

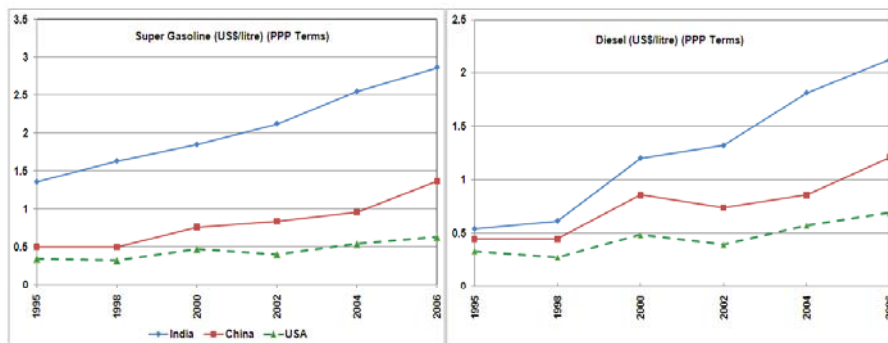
Source: Energy Information Administration, USDOE

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Drivers of Transport Energy Intensity

High fuel prices, with a high share of taxes, help discipline fuel demand growth.



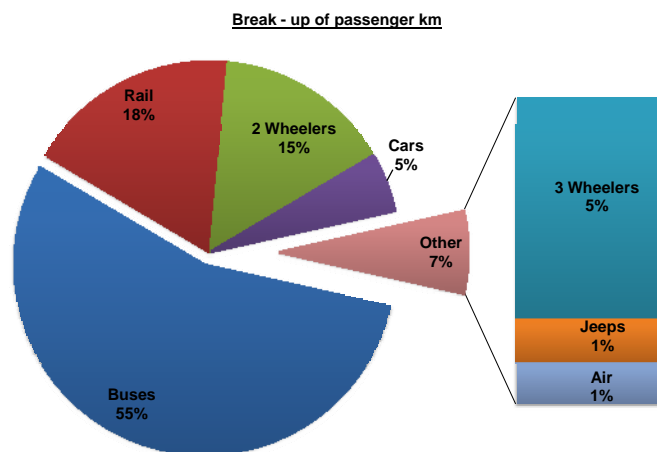
Indian Super Gasoline Prices are 60% higher than the prices in USA even in the Market Exchange Rates

Source: GTZ, International Fuel Prices 2007

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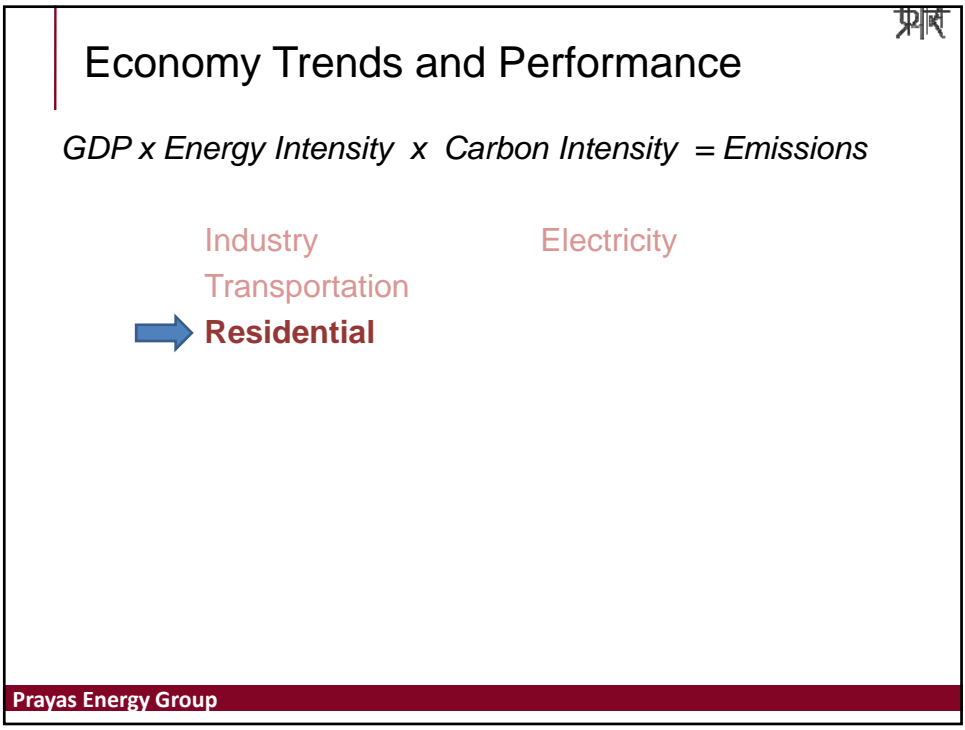
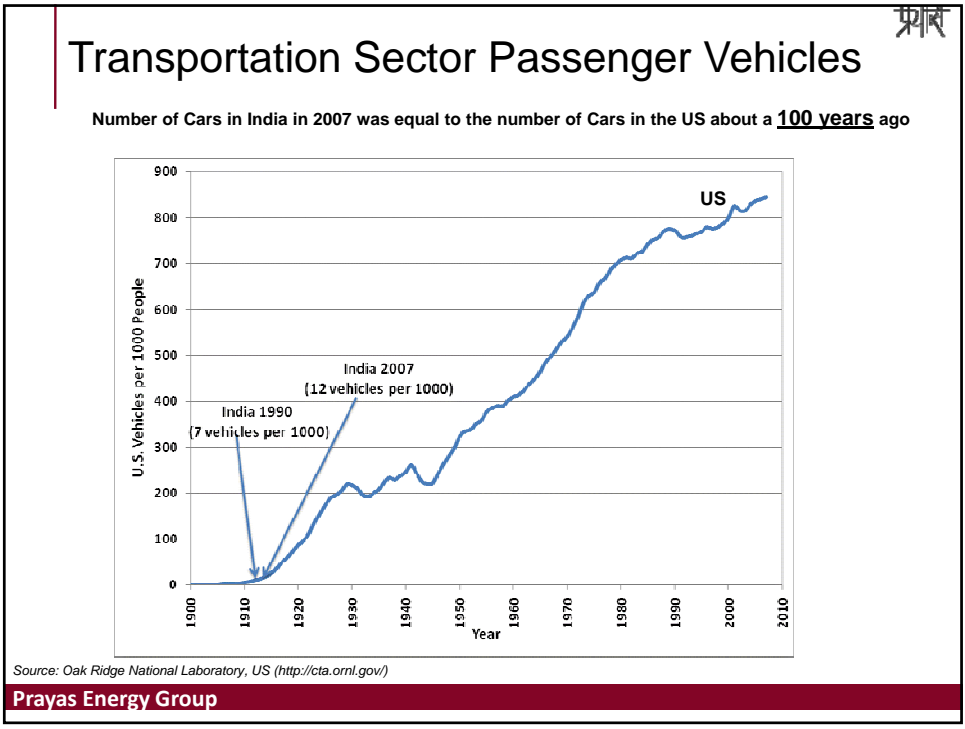


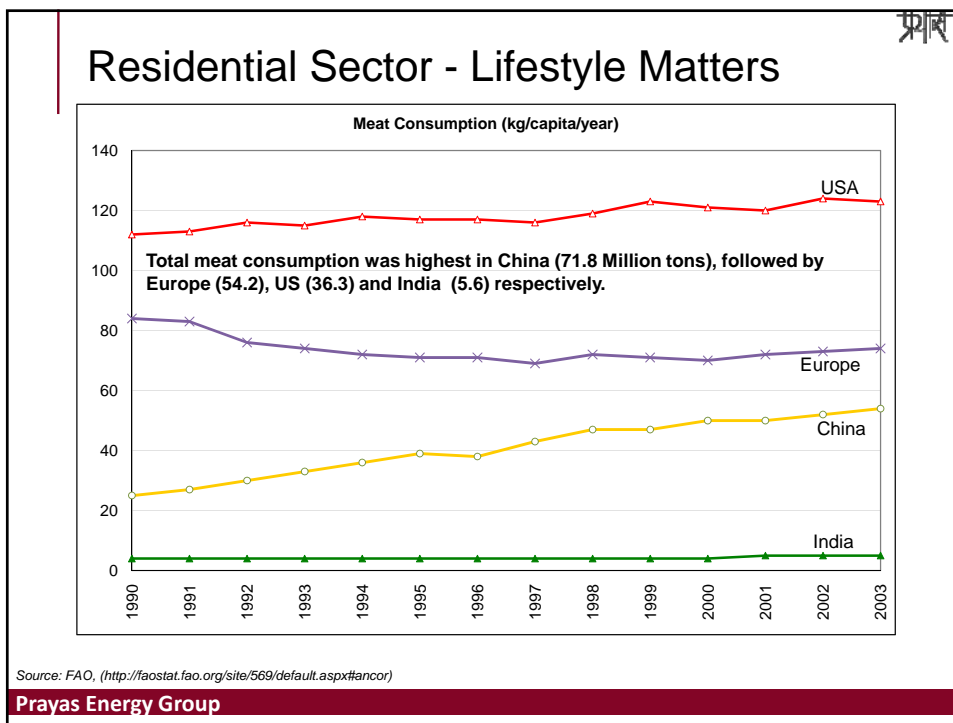
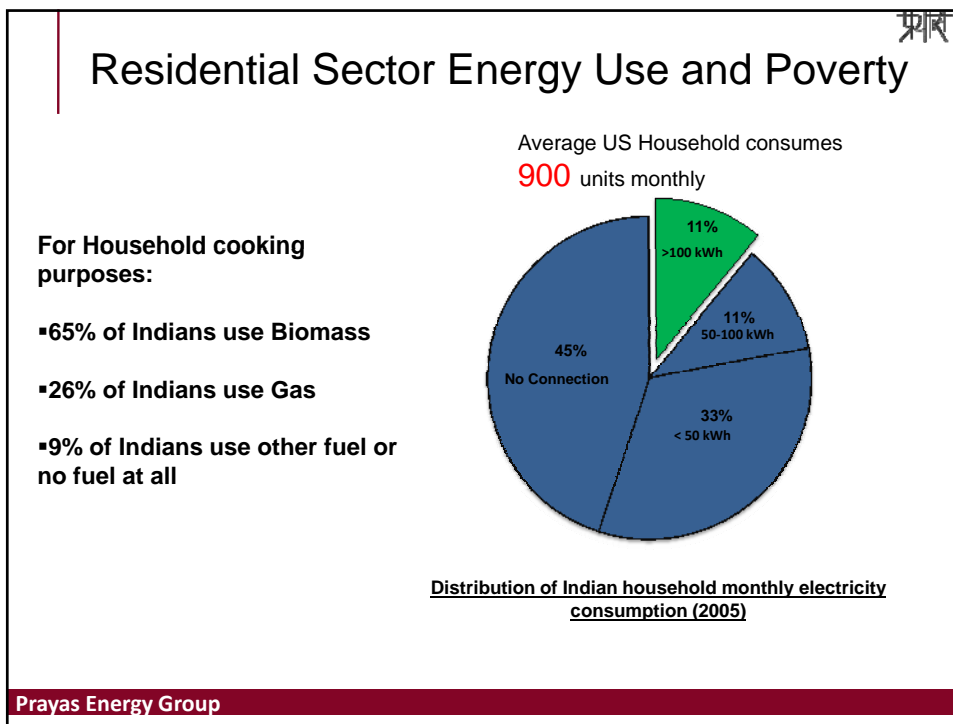
Modes of Transportation



Source: LBNL, 2009

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Drivers for Low Energy use by households

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- Telescopic tariff (high tariff for high energy consumers)
- Dense urban areas, (small houses, low distances to travel)
- System has still designed for low energy use (but changing fast)
- Need to prevent change of “cross-subsidies” (like reduced taxes on aviation fuel !)

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Renewable, Fuel Diversification Policies

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- State Initiatives
 - Renewable Purchase Obligations
 - *Recent Proposal*
 - Renewable Energy Law
 - National Gas market development
 - New Exploration and Licensing policy
 - Nuclear power (20 GW)
 - Large Hydro emphasis (50 GW)
- } *Face controversy and implementation challenges*

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Energy Efficiency Policies

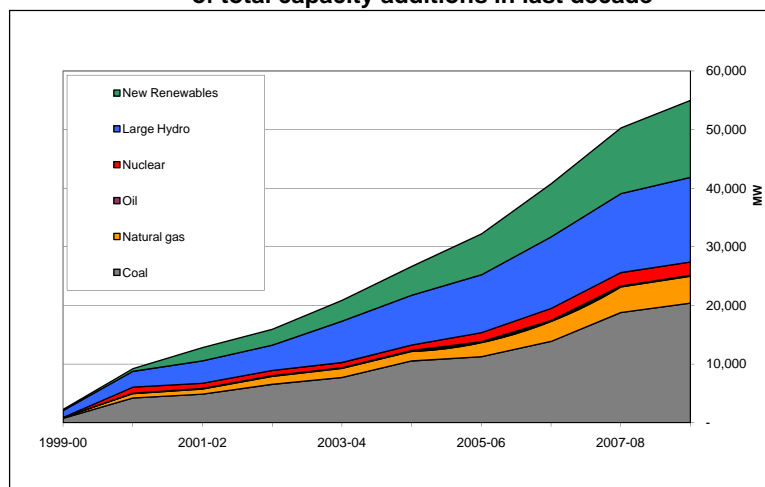
- Innovative Programs and Institutions
 - Standards and labeling
 - Appliances, energy Conservation, building code
 - Training and capacity building
- State Demand Side Management (DSM) Programs
 - Compact Fluorescent Light distribution
- Investment /Financing
 - Electric grid upgrade

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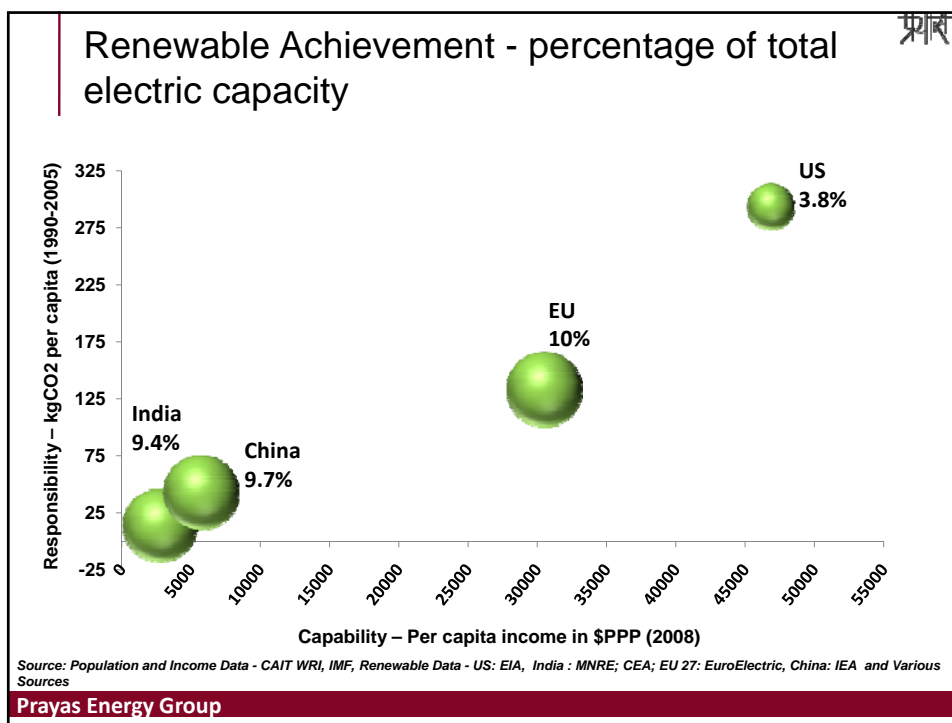
Incremental Electric Capacity Addition in last decade

Coal 37%, while renewables (including large hydro) contributed to 50% of total capacity additions in last decade



Source: Ministry of New and Renewable Energy, Central Electricity Authority

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National Action Plan on Climate Change

- National Solar Mission
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat
- National Mission for a 'Green India'

- National Mission for Sustainable Agriculture
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission on Strategic Knowledge for Climate Change

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Development and Poverty Challenge for India

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Poverty rates have declined, but not absolute poverty.

	People living below \$1.25		People living below \$1	
	Absolute Number	Percentage	Absolute Number	Percentage
1981	421 million	60	296 million	42 percent
2005	456 million	42	267 million	24 percent

Source: World Bank

About 99 percent of Indians live below the US poverty line.

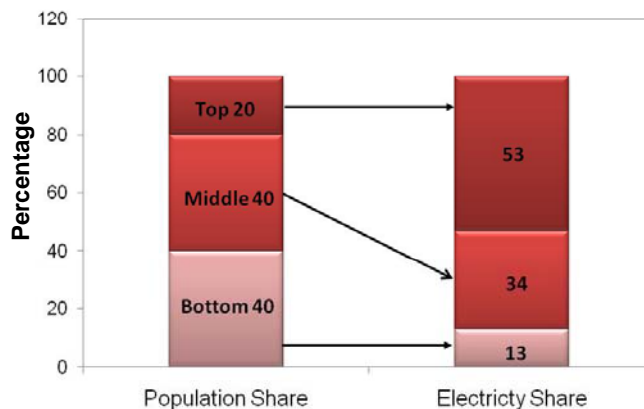
Sources: Martin Ravallion, "The developing World's bulging (but vulnerable) Middle Class", Development Economics Group Policy Research Working Paper 4816, January 2009, p.7

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Energy and Development - Equity

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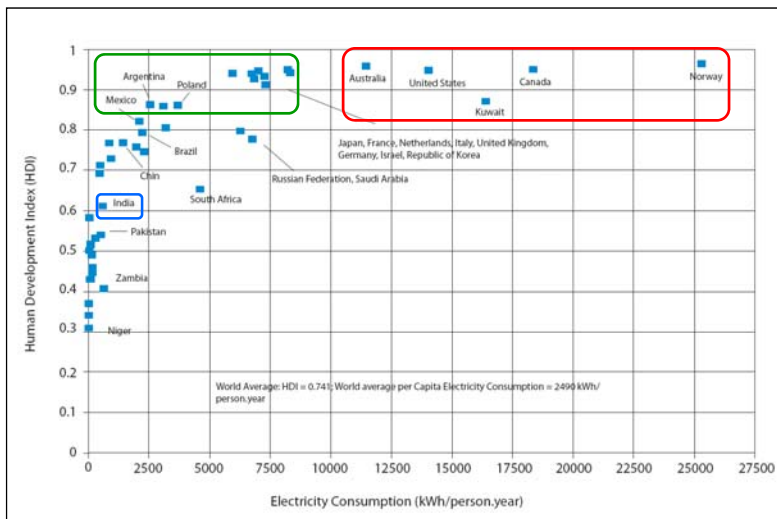
Distribution of Electricity Consumption by Income Class



Source: National Sample Survey Data, 2004-05

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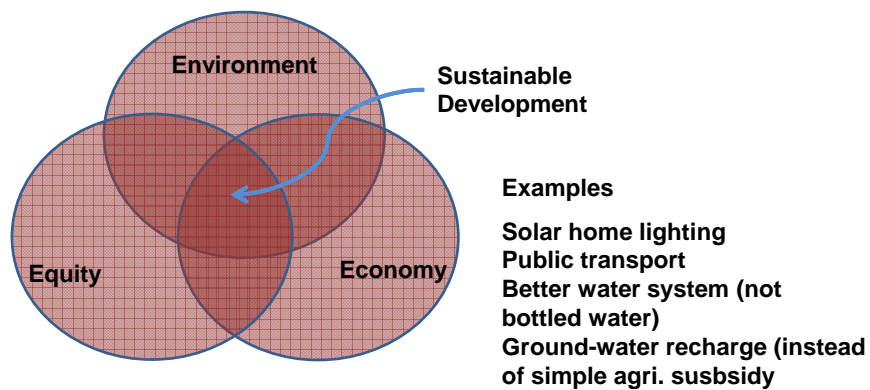
Energy and Development



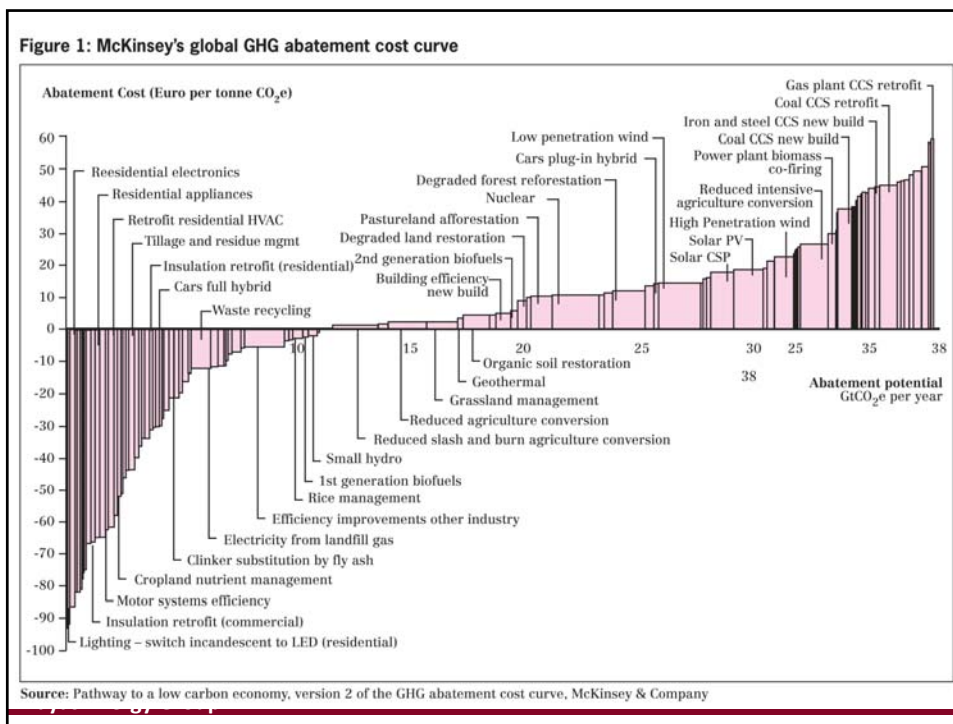
Source: Dr. Steve Chu, Department of Energy, US

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Aligning Clean Growth with Development



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THANK YOU

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