Improving Models To Better Address Ground Realities An Indian Perspective

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India's Energy Imperatives To Support 8% + Growth

- India's primary energy supply to grow by 4.3-5.1% from the 2005-06 level of about 510 MTOE to reach 1536 to 1887 MTOE by 2031-32 for GDP growth of 8%+.
- India's share of world fossil fuel supply in 2005 was 3.7%. This could become 7.6 to 10.9% by 2031-32.
- India's incremental requirement could account for 13-21% of the world's incremental supply by 2031-32.
- India would need to tap all available energy supplies and pursue all available and emerging energy technologies.
- Above all India must lower energy demand through energy conservation and higher energy efficiency

India's Energy Intensity Falling



India Is NOT Following The Fuelish Path of Industrialized Countries

Energy intensity expressed as the amount of energy (in equivalent metric tonnes of petroleum) consumed to yield 1000 dollars of GDP



World Bank Assessment Of India's Relative Emission's Performance

India is a relatively low carbon economy

- India has been offsetting its CO₂ emissions growth resulting from growth in population and high GDP growth by lowering energy intensity and improving the carbon intensity of its fuel mix
- India has achieved these offsets despite a low initial emission level and against a backdrop of increasing CO₂ intensity world wide between 1999-2004
- Most independent projections indicate that India's CO₂ intensity is likely to continue to decline through 2030-2050

India's Energy Consumption & Energy Intensity In The Global Context

Country	TPES Per Capita (Kgoe)- <mark>2005</mark>	TPES /GDP (Kgoe/\$-2000 PPP)-2005
Russia	4520	0.47
China	1320	0.22
US	7890	0.21
Germany	4180	0.16
Japan	4150	0.15
Brazil	1120	0.15
India	468	0.15
UK	3880	0.14
Denmark	3620	0.12
World	1780	0.21
INDIA 2031-32	1065-1279	At Par With Best

Source : IEA, World Bank, 2031-32 estimate from Integrated Energy Policy

The 2° C Poverty Trap

(Annex I -40% by 2020 and -90% by 2050; Global Emissions -80% By 2050 From1990 Levels. Probability of exceeding 2°C 14%-32%)



Source: Heinrich Boll Foundation, EcoEquity & Stockholm Env. Institute

CO_2 Emissions - 2005

	2005 CO ₂ emission (million tons)	2005 population (million)	2005 CO ₂ emission/ Capita (tons)	
I. OECD	13548	1166	11.62	
II. Countries with emission > 3 tons/ capita/annum in 2005	11515	2064	5.58	
Sub-total (I+II)	25063	3230	7.76	
III. Low emitters	3130	3215	0.97	
Total	28193	6445	4.37	
Assuming zero emissions from low emitters, 57.2 % reduction would be required within the borders of T & TT to deliver 50 % of 1990 CO2 emission and 83% to				

deliver emissions at 20% of 1990 level. Source: EIA, UN data base.

Per Capita Convergence In 2050 With Total CO₂ Emissions At 50 % of 1990 level

	2050 CO ₂ emission (million tons)	Reduction over 2005 CO ₂ emission (%)	2050 population (million)	
I. OECD	1539	88.64	1327	
II. Countries with emission > 3 tons/ capita/annum in 2005	2721	76.37	2346	
Sub-total (I+II)	4260	83.00	3673	
III. Low emitters	6462	-106.49	5571	
Total	10722	61.97	9244	
Category TTT unlikely to trade their limited head room which will also vanish at				

20% of 1990 level. Reductions must take place within the borders of I & II 9 Source: EIA, UN data base.

Different CGE Models Run For Same Scenarios Give Widely Varying Results For Indian Share Of Global Emissions



Source: Weyant & Parikh, 2004

Qualitative Results: Carbon Intensity Of India's GDP Will Keep Falling



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