

Bio-Fuels In India

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The Indian Backdrop

- 2006-07: Primary Energy: 539 MTOE; Commercial Energy 391 MTOE
- Energy Mix: Coal & Lignite - 38.7%, traditional biomass-27.4%, oil-24.6%, gas-6.7%, hydro-1.8%, nuclear-0.9% and renewable 0.2%.
- India's 2007 share of global commercial energy supply was 3.7%. Top 4 consume about half led by US (21.3%), China (16.8%), Russia (6.1%) & Japan (4.7%)
- India's per capita commercial energy consumption is about 20% of the world average, 4% that of the US and 28% that of China

The Indian Backdrop Continued

- ❑ Some 550 million Indians live without electricity
- ❑ Traditional biomass primary or only cooking fuel for over 700 million fellow Indians and cooking accounts for over 80% of their household energy consumption
- ❑ The 830 million Indians living below \$2 a day exceed the combined population of EU, US, and Japan
- ❑ Over a third of the world's poor live in India. Number of poor 17% to 53% higher than Sub Saharan Africa at poverty lines between \$1.25 and \$2.50 per day
- ❑ 17% of world Population, 2.4% of land mass, 4% of water resource as per Govt. data but actual resource estimated to be lower by independent experts ³

The Indian Backdrop Continued

- ❑ Well over half of Indian livelihoods depend directly on agriculture and 60% of cultivated land is rain-fed
- ❑ Average rural land holding in 2003: 0.73 Ha/Household and falling. Average holding less than 50% of the 1971 level
- ❑ Lack of access to energy & water & the small land holdings lead to low productivity and food insecurity. Climate change is further compounding these problems
- ❑ Consequent poverty and the absence of a social security net feed disempowerment, gender bias, illiteracy, poor health, higher infant and maternal mortality and a low HDI
- ❑ The HDI of the World's 4th or 5th largest economy in PPP terms is comparable to sub-Saharan Africa ⁴

Sustainability Dimensions of Bio Fuels

- ❑ India energy deficient. Must tap all forms of energy including bio-fuels. But food, livestock, industrialization and urbanization compete for same scarce land & water resource
- ❑ Bio fuel sustainability typically measured in terms of:
 - GHG Mitigation Potential & Net Energy Balance
 - Impact on Food/Energy Security
 - Economic Viability
 - Employment Generation & Poverty Reduction Potential
 - Rural Development
- ❑ I prefer excluding the last two measures. Bio-fuel not being pursued to meet these two objectives. Many alternatives to meet the last two objectives

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Sustainability Dimensions of Bio Fuels Continued

- ❑ GHG reduction potential country and region specific. No single metric or standard for conducting LCA. Inclusive of land use changes, carbon debt of 17 to 840 years
- ❑ Diversion of grazing lands, wetlands, forest lands and arable land driven by subsidies, competition and profitability
- ❑ Higher food prices, poor get poorer because no surplus to sell - end up losing land
- ❑ Water and fertilizer necessary for commercial yields
- ❑ Economics uncertain. Seek subsidies on inputs and outputs

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Sustainability Dimensions of Bio Fuels Continued

- ❑ Production & consumption of bio-energy in a localized & decentralized manner consistent with age-old patterns is indeed sustainable
- ❑ However, adaptive measures essential for large scale commercial energy plantations, their net energy balances & impact on global & local eco-systems under local production methods need to be established
- ❑ Impact on local socio-economic settings, livelihoods of indigenous people, migration, land holdings, food & water security need to be researched specifically for each area
- ❑ Research also essential for establishing viable germ plasms & genotypes for different plant species
- ❑ Second generation bio-fuels show promise but need RD&D⁷

Current Policies For Promoting Bio-Fuels In India

- ❑ No National Policy yet
- ❑ A 0.3 million Ha. National Mission on Bio Diesel costing some \$160 million announced under Ministry of Rural Development in 2005-06. Some \$12 million spent in 19 States to date. Further sanctions pending appraisal of outcomes
- ❑ State Governments offer several incentives for bio-diesel: Waste Land, Free or Subsidized Inputs (grafted seeds, saplings, water, fertilizer) MSP, MPP, use of funding available under the employment guarantee scheme etc
- ❑ Approach/incentives not consistent among State Governments
- ❑ Ethanol is produced as a by product in the highly politicized sugar industry that enjoys several subsidies on inputs and outputs. Sale of ethanol among competing end uses, especially the tax earning use in the liquor industry, is controlled by State Governments

Current Policies For Promoting Bio-Fuels In India Continued

- ❑ Fuel Blending, Chemical & Pharmaceuticals add more value progressively to ethanol but are outbid by liquor industry
- ❑ Private promoters using State Governments incentives to produce seed through contract farming - mainly for export
- ❑ No hard numbers are available but a few hundred thousand tons of bio diesel may have been exported in the form of seed/liquid to benefit from EU subsidies
- ❑ No production tax on bio-fuels. Local producers protected by varying levels of import duties based on end use.
- ❑ Ethanol not available to even meet 5% doping against mandated 10%. Seed/fuel production equivalent to about 1Mt of bio-diesel

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The New Draft National Bio-Fuel Policy

- ❑ Proposes a National Bio-fuel Coordination Committee under the PM with 7 concerned Ministers as members and a Bio-fuel Steering Committee under Cabinet Secretary with Secretaries of concerned 10 departments as members.
- ❑ Proposes a MSP for oil seeds and MPP for bio-diesel. Mandates blending- indicative target of 20% by 2017. Recommends that import restrictions remain in place. Policy silent on ethanol.
- ❑ Proposes support including tax breaks for corporations for bio-diesel plantations on waste or community lands. Use of fertile land not prohibited but no Government support.
- ❑ A committee of bio-technology department and MNRE proposed to support R&D for developing High Yielding Varieties

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The Desirable Policy Framework for Bio-fuels in India

- ❑ Bio-fuels promoted as a domestic green energy resource & a potential chemical feedstock. Multiple objectives such as rural incomes/employment, can potentially muddy analysis
- ❑ Emphasize resource efficiency and productivity. Bio-fuels & traditional crops benefit through sustainable agriculture
- ❑ Abolish subsidies on bio-fuels till truly green bio-fuel found
- ❑ Support & fund collaborative region specific research to answer sustainability concerns of first generation bio-fuels
- ❑ Support & fund research for second generation bio-fuels that seek to engineer enzymes or turn living organisms into biochemical pathways to produce fuel

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The Desirable Policy Framework for Bio-fuels in India

- ❑ Support & Fund research in cellulosic ethanol & the use of algae to produce bio-fuels from waste. Research must factor impact of diverting waste on soil quality
- ❑ Remove price and tax distortions among fuels and between end uses for same feedstock. Outputs can be taxed differently to meet different objectives
- ❑ No mandated doping requirements till sustainability proven
- ❑ Establish a regulatory framework to earmark and certify use of land, water & energy for bio-fuels. Establish & regulate the local metric used to measure how "green" is a bio-fuel
- ❑ Provide 100% tax credit to all investments in research. Only subsidize research till a truly green bio-fuel found. Promote use of available waste and residual oils for fuel.

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