

Options and strategies for an environmentally sustainable biofuels production and trade

Side event organised by ICTSD & SEI
Bali, 4 December 2007



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(With inputs from Martina Otto, UNEP)



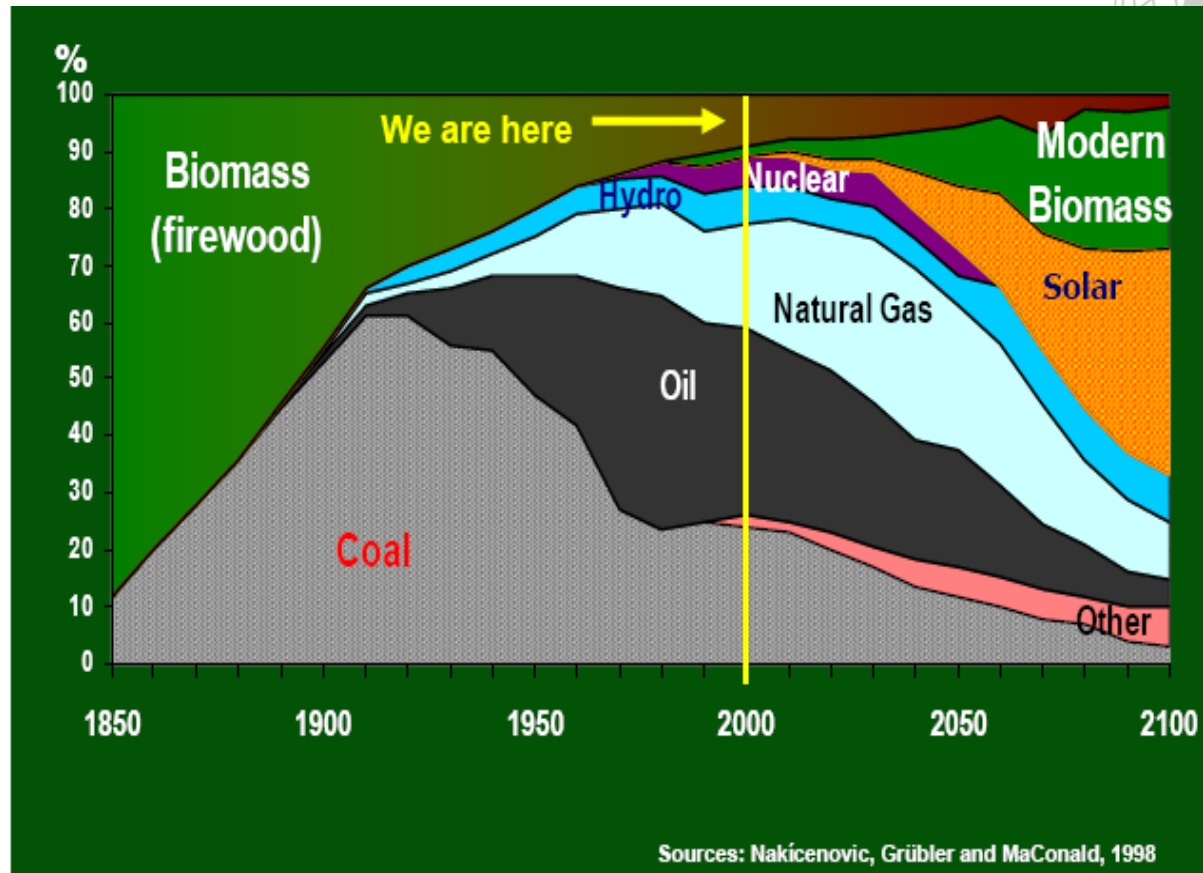
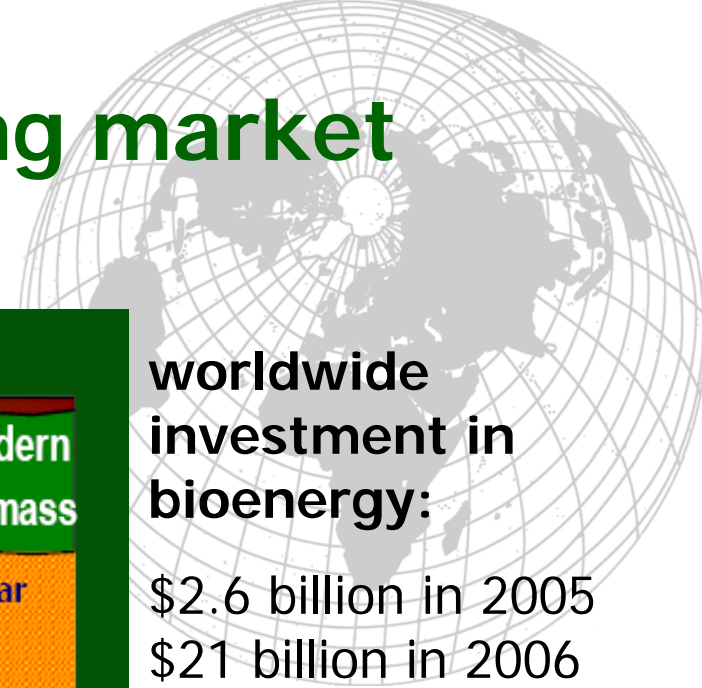
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bioenergy – a fast growing market



worldwide investment in bioenergy:

\$2.6 billion in 2005
\$21 billion in 2006

main drivers:

- energy security
- climate change
- rural development



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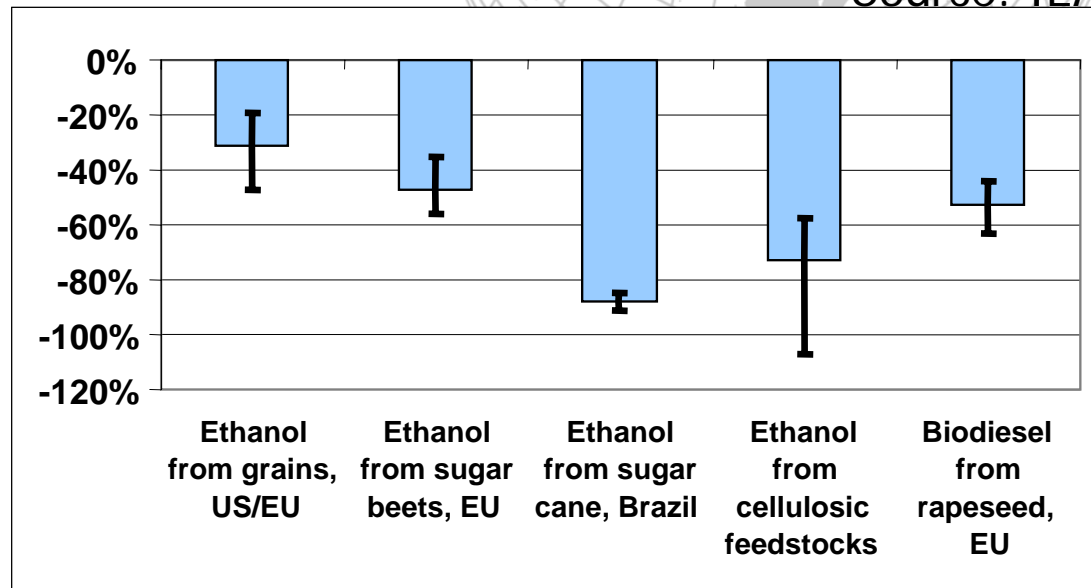
climate change - potential for CO2 emission reductions

Plants grown as feedstocks for biofuel production absorb CO2 from the atmosphere; biofuel combustion releases the CO2 previously absorbed by the plant.

Source: IEA

CO2 balance depends on:

- crop choice
- location
(geo-climatic conditions)
- production methods
(mechanisation, burning fields)
- conversion pathways
(by-products for co-generation)
- transport needs
(from production sites to conversion facilities to the end-user)
- end-use efficiency



Well-to-wheel CO2-equivalent GHG emissions from biofuels, per km, relative to base fuel



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climate change - risk of CO2 emission increases

Land use changes need to be taken into consideration.

Projects start with a negative balance, e.g.:

- if forests are cut down to plant energy crops
- if peatlands are drained to plant energy crops (resulting in peatland fires)



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biodiversity



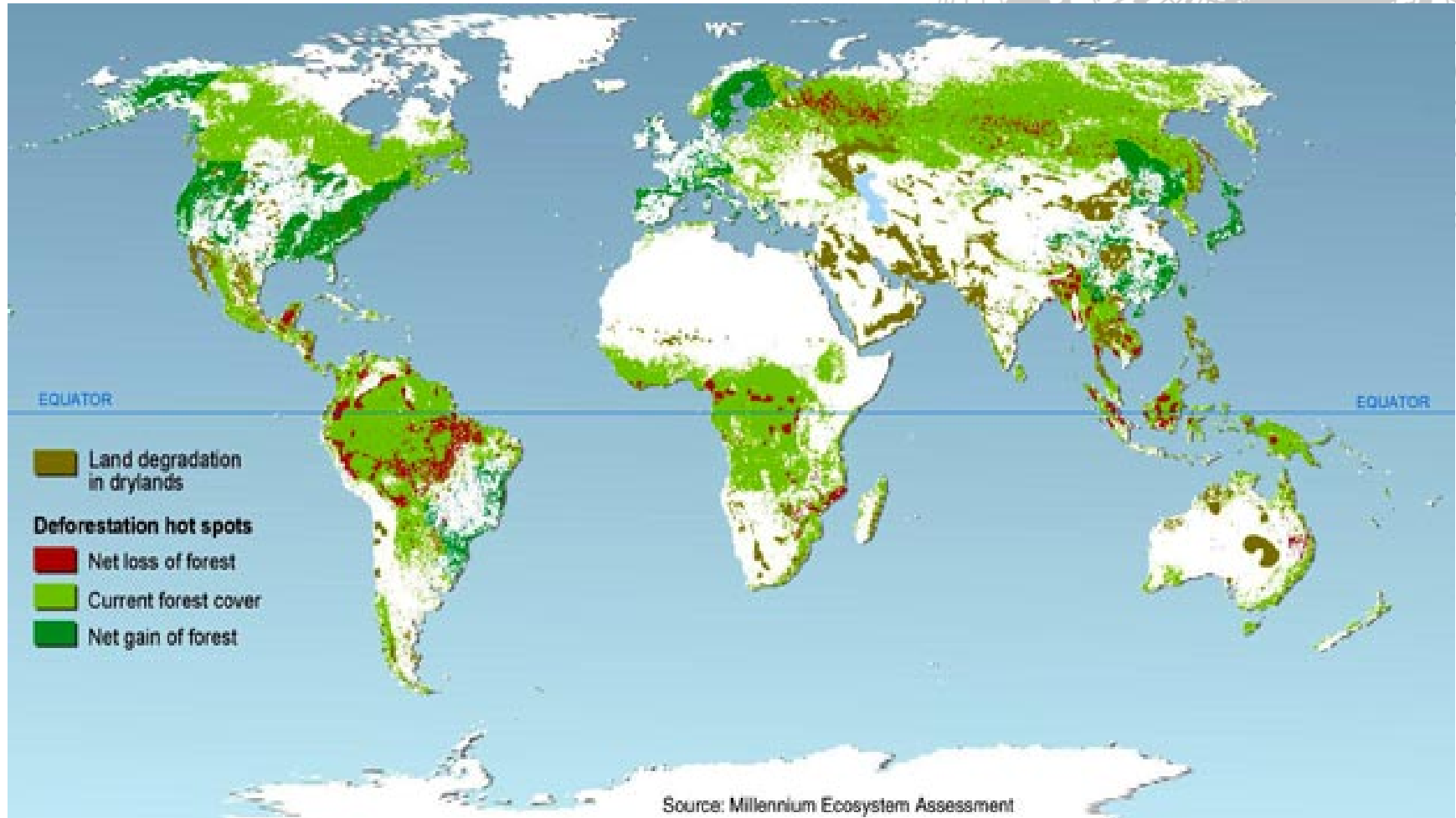
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prime biofuel production locations match with biodiversity hotspots



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water - risk of overuse and contamination

Expansion of cultivation of energy crops requires water and can result, if not properly managed, in the lowering of water tables as well as reduced water levels in rivers and lakes due to irrigation.

This is of particular concern in countries with scarce water resources.

By producing crops like jatropha and sunflower which thrive in drier climates and require less water, these risks can be reduced. Careful matching of crops to available water resources is critical to ensure sustainability.

Intensive agriculture, going hand in hand with extensive use of fertilizers, poses another risk: water eutrophication due to nitrogen and phosphate in fertilizers. Use of agrochemicals can be reduced by carefully choosing and rotating crops.



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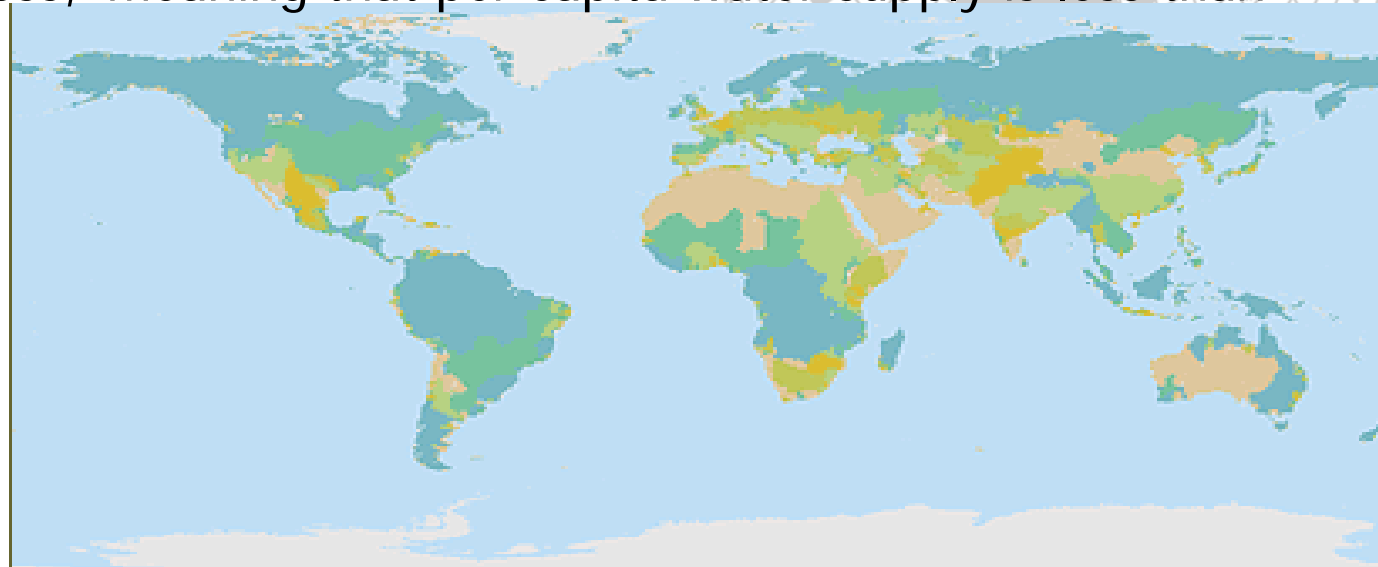
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water - risk of overuse and contamination

41% of the world's population, or 2.3 billion people, live in river basins under 'water stress,' meaning that per capita water supply is less than 1,700 m³/year.



Annual renewable water
(m³/person/year)

 < 500

 1,000 - 1,700

 4,000 - 10,000

 No data

 500 - 1,000

 1,700 - 4,000

 > 10,000

Source: WRI, 2006



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soil - risk of erosion and degradation

As with all agriculture production, soils can degrade if not managed sustainably by employing conservation techniques such as crop rotation and the planting of hedgerows. There is a risk of nutrient leaching and acidification.

On the other hand, crops such as *Jatropha* planted on marginal land can help recover land and fight desertification.



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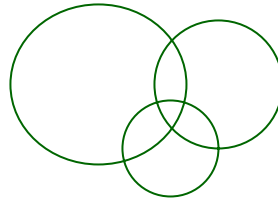
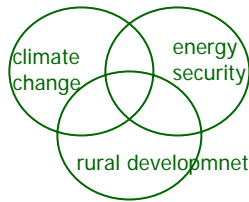
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tradeoffs



...between the main drivers



...between the local and global agendas

There can be a conflict between issues of global and local environmental concern. At the same time, local environmental concern can push global environmental achievements.



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tools to ensure sustainability



- near-term research involving developing countries
- knowledge and technology transfer
- appropriate policies, institutional and legal frameworks
 - Bioenergy plans
 - Water protection
 - Biodiversity protection
- enforcement of environmental laws and regulations
- institutional capacity building
- internationally agreed system (certification or other assurance) to ensure sustainability of biomass intended for biofuels production



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sustainability criteria – a means for making informed decisions

- Risk management on the side of investors (financial risk)
- Risk management in the supply chain (reputational risk)
- Bioenergy planning on the side of governments (checklist for ensuring sustained use of natural resources)
- Consumer (informed choice)



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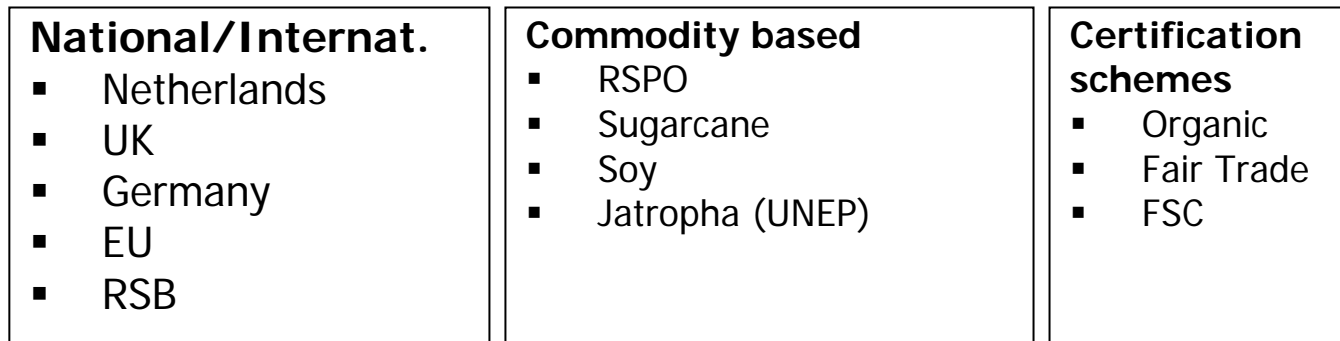
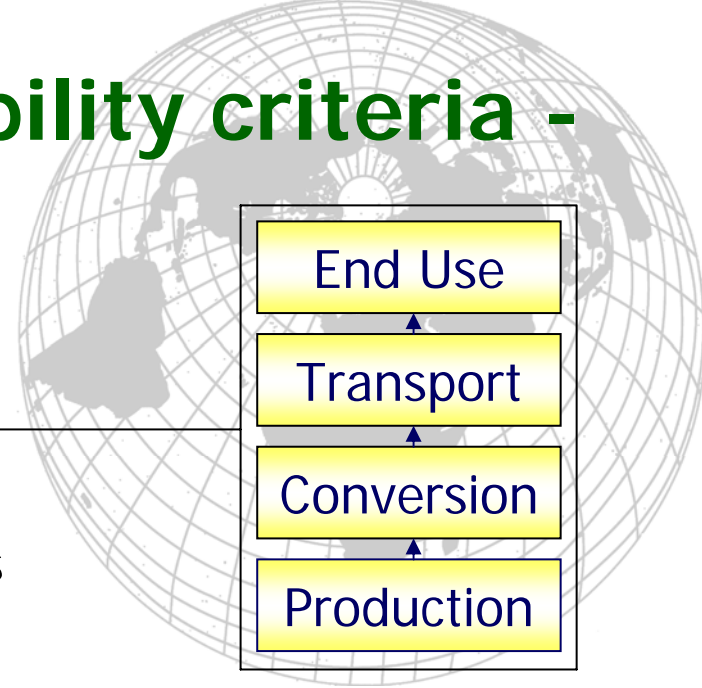
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development of sustainability criteria - approach

- 3 pillars of sustainable development
- Life cycle approach
- Building on existing initiatives as to avoid duplication and build synergies



- Multi-stakeholder outreach in the different regions (UNEP and RSB already held meetings in Brazil with the kind support of Petrobras, and one in China with the kind support of Michelin)



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working with UN sister agencies, the private sector, NGOs and governments on:

- research and tools to provide decision-makers in governments and the private sector with information (natural resources panel; due diligence guidelines for the finance sector; packaging of existing maps on geo-climatic conditions, water resources, biodiversity hotspots, famine)
- sustainable business models for renewable energy development in developing countries / mobilising investment (feasibility study with Ericsson/Jatropha in Tanzania, Jatropha Roundtable)
- sustainability criteria and certification options (RSB, GBEP)



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CDM Methodologies for Biofuels

- ❖ Ensuring consumption in host country can be monitored
- ❖ Avoiding double counting of CERs claimed by producers and consumers (upstream vs downstream)
 - Checking consumption against production, feedstock vs. final products trade and use for net fossil energy replacement
 - Ensure ERs happen in non Annex-I countries
 - Project boundary potentially infinite with global trade
- ❖ Land-use leakage, including impacts on deforestation
 - same problems in AR, and combined projects
 - Projects based on waste oil etc. can get around the latter

Key methodological issues have been identified. They are challenging but not insurmountable .



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