

Bioenergy Development:

Issues and impacts on poverty and natural resource management

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Study objectives

- Provide an overview of bioenergy developments and examine the main issues and possible socio-economic implications of these developments and their potential impacts on land use and the environment, especially with respect to forests.
- Present an introduction to bioenergy, provide a background and overview of solid biomass and liquid biofuels, and examine opportunities and challenges at the regional and country level.



Principle study findings

Finding 1: Solid biomass will continue to provide a principle source of energy and should not be overlooked

Finding 2: There are likely to be major land use implications resulting from bioenergy developments

Finding 3: It is critical to consider tradeoffs, including those related to poverty, equity and the environment when choosing a bioenergy system

Finding 4: There is considerable potential for greater use of forestry and timber waste as a bioenergy feedstock in developing countries

Finding 5: The climate benefits of bioenergy development are uncertain, and highly location and feedstock specific

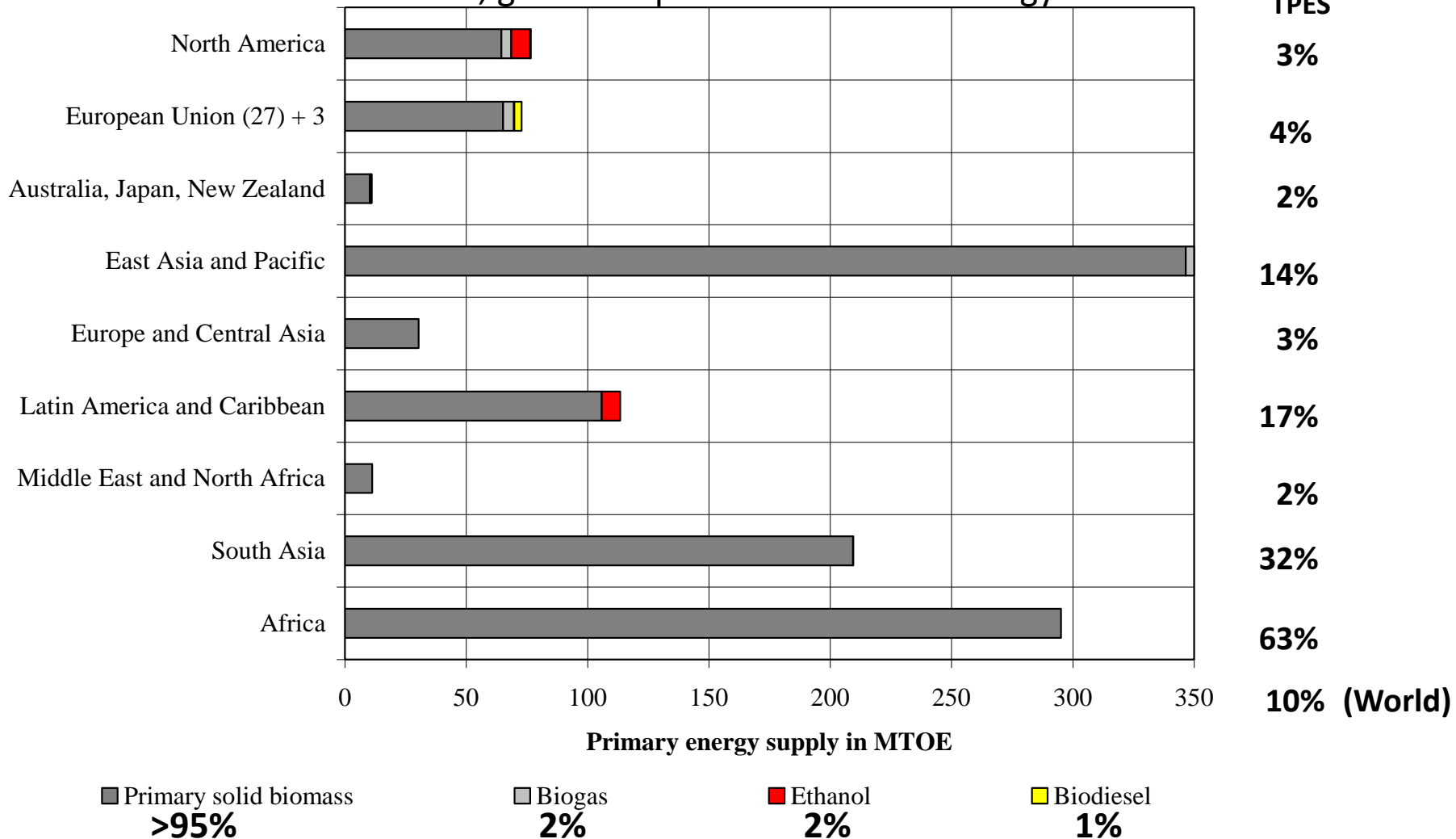


Finding 1

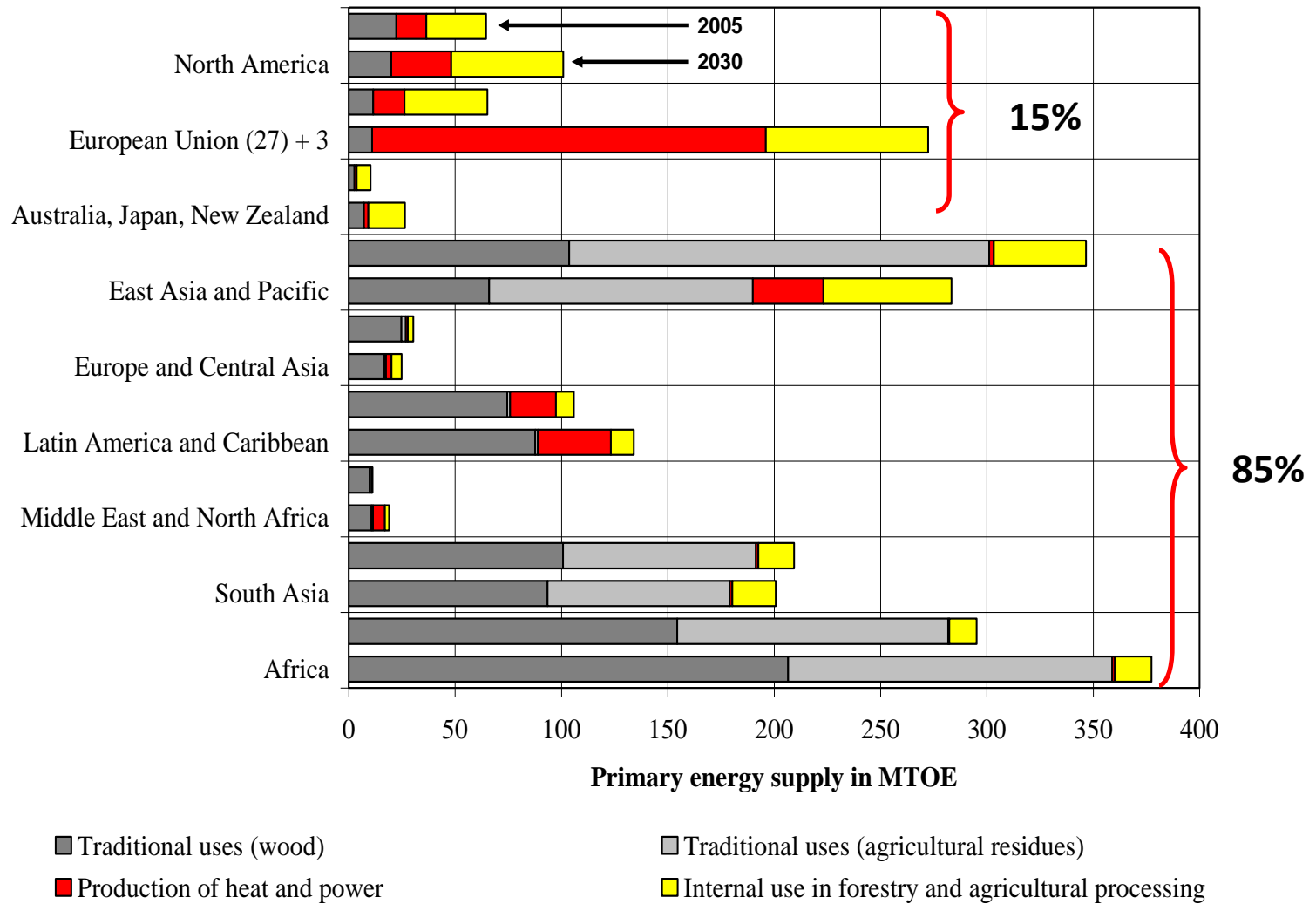
Solid biomass will continue to provide a principle source of energy and should not be overlooked



Contribution of solid, gas and liquid biofuels to bioenergy in 2005



Distribution of TPES from primary solid biomass by region and type in 2005 and projections to 2030

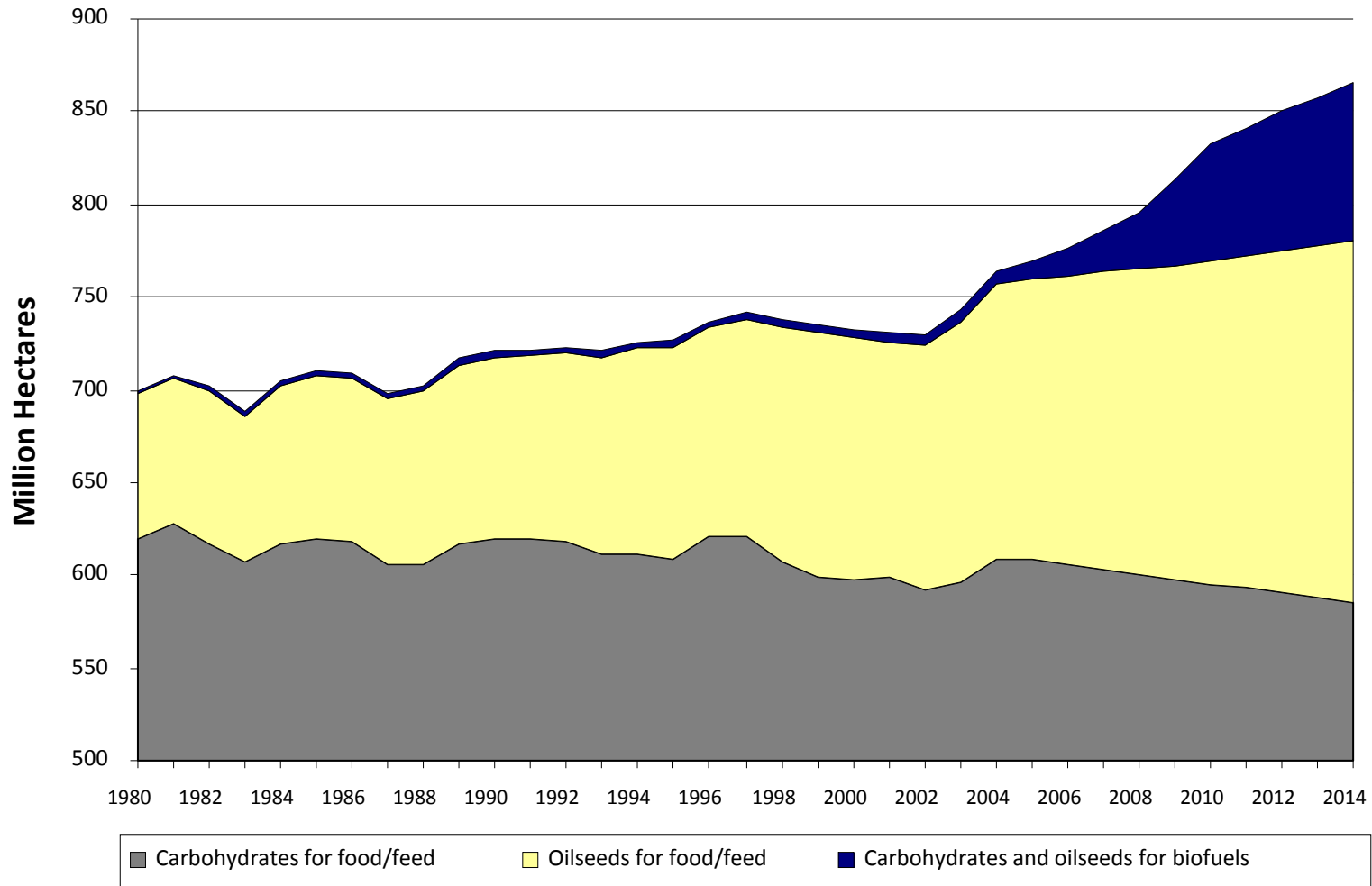


Finding 2

There are likely to be major land use implications resulting from bioenergy developments



Estimation of Global area needed to meet food/feed and potential liquid biofuel demand



Source: LMC International, 2008

Finding 3

It is critical to consider tradeoffs, including those related to poverty, equity and the environment when choosing a bioenergy system



	Corn	Sugarcane	Sweet Sorghum	Cassava	Nypa Palm	Soy	Oil Palm	Rapeseed	Jatropha	Jojoba	Pongamia
Employment potential	Low	Medium	Medium	Medium	High	Low	High	Low	High	High	High
Potential for smallholders	Low	Medium	High	High	Medium	Low	Medium	Low	High	Variable	High
Improvement of degraded land	Low	Low	High	High	High	Low	Low	Low	High	High	High
Impact on natural forests	Variable	Variable	Low	Low	Low	High	High	Medium	Low	Low	Low
Impact on agriculture	High	Low	Low	Low	Low	High	Low	High	Low	Low	Low
Resource competition	High	Low	Low	High	Low	High	High	High	Low	Low	Low
Impact on water resources	High	Medium	Medium	Low	Low	Medium	High	High	Low	Low	Low
Impact on soil resources	High	High	Low	Low	Low	Low	High	High	Low	Low	Low
Impact on biodiversity	Variable	Variable	Variable	Variable	Low	High	High	Variable	Medium	Medium	Medium
Invasiveness	Low	Low	High	Low	High	Low	High	High	High	Low	Medium

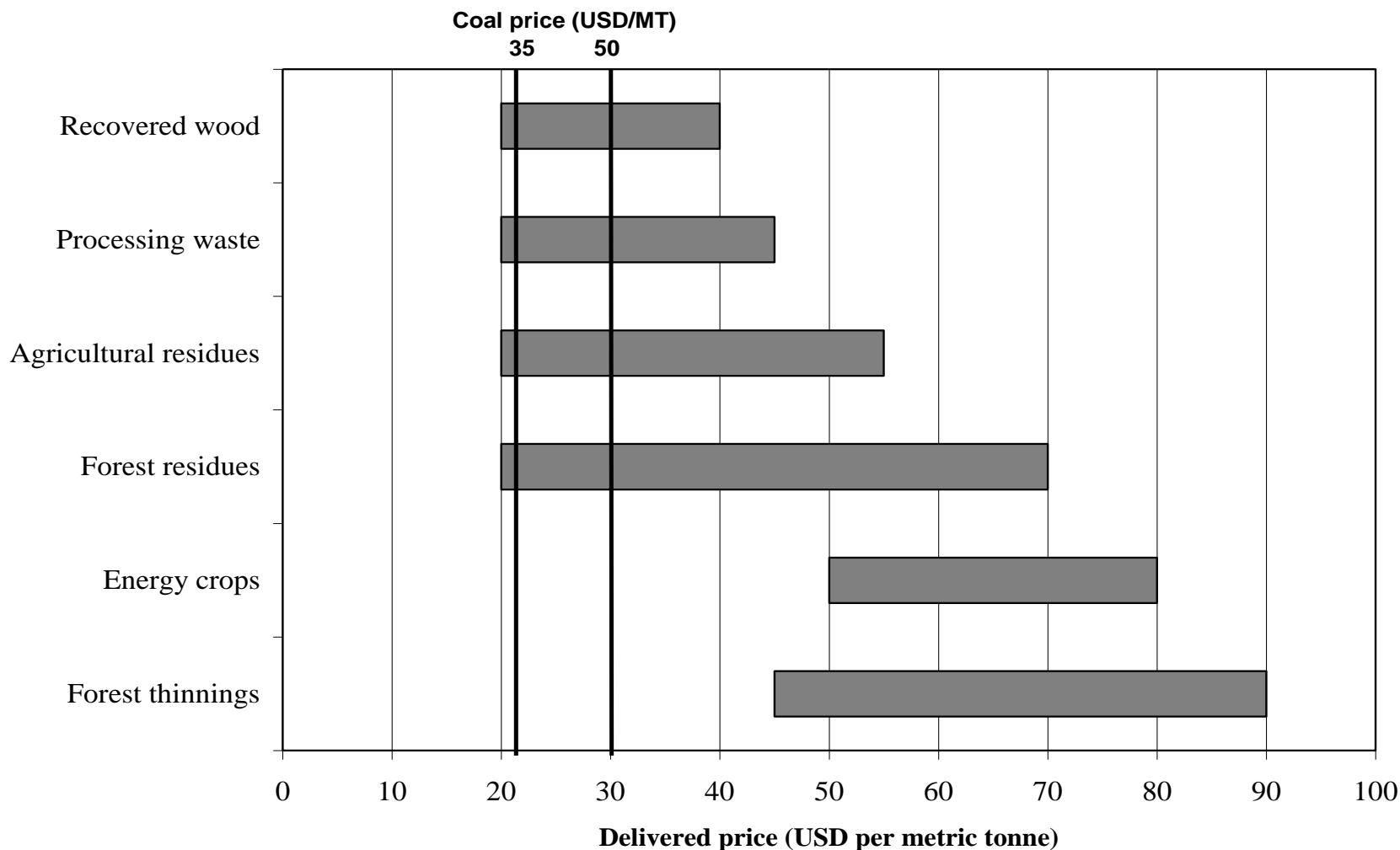


Finding 4

There is considerable potential for greater use of forestry and timber waste as a bioenergy feedstock



Typical range of delivered costs for coal and biomass in developed countries



Source: Multiple sources

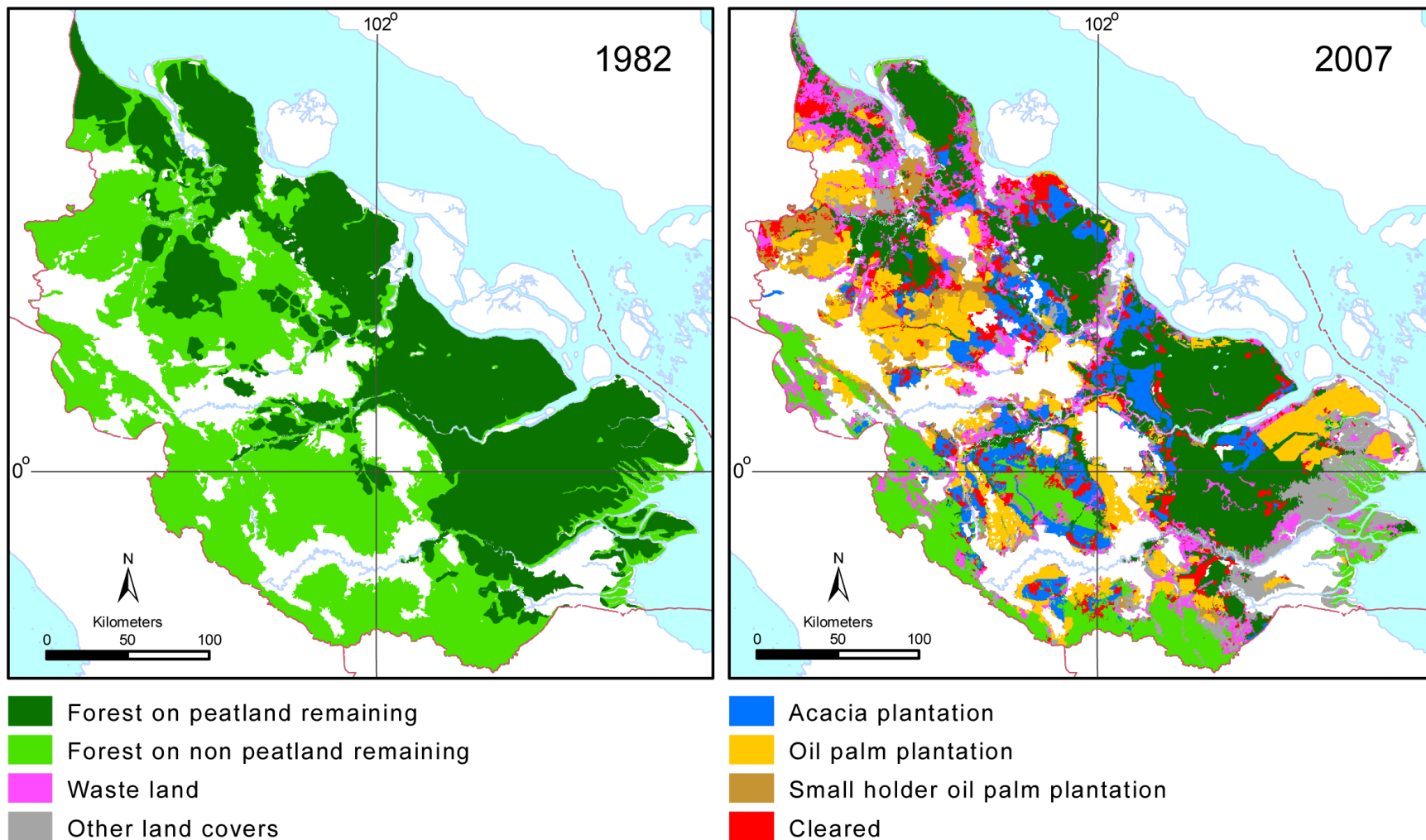


Finding 5

The climate benefits of bioenergy development are uncertain, and highly location and feedstock specific



Impacts of large scale farming and forest plantations, Riau, Indonesia



Source: Uryu, Y. et al. 2008



Regional findings

- Africa – new investment opportunities; dependence on traditional woodfuels; water use
- Latin America and the Caribbean - likely to become a net exporter; sustainability criteria
- East Asia and the Pacific- likely to have both net exporters and importers; forest conversion and land use conflicts
- South Asia – land use assessments; water use
- Europe and Central Asia – low growth; some pellet export opportunities
- Middle East and North Africa – bioenergy is likely to play a minimal role



Policy Implications

- Consumer countries: upstream impacts of bioenergy mandates and targets
- Producer countries: balance production targets with environmental and social concerns
- Investors: investments should meet best practices for environmental, social, and climate considerations



Identified opportunities and challenges

- New initiatives are placing demands on environmental goods and services, and lands are being assigned a monetary value
- Balancing profits with environmental sensitivities and have positive social impacts
- Other opportunities including biochar and advanced stoves



Thank you!

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