Stabilizing the Agricultural Frontier: Leveraging REDD with Biofuels for Sustainable Development

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IEA Bioenergy Task 38:
Biomass and Bioenergy 2011
Avaiable on-line

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Explicitly link the cultivation of biofuel feedstocks with forest conservation and reforestation

REDD + Biofuels

- Ratio of 4:1 -- forest conservation **:** biofuel cultivation
- Agricultural frontier (deforested 2000 – 2010)

RDL + Biofuels (*RDL = Reforestation of Degraded landscapes*)

- Ratio of 1:9 – reforestation **:** biofuel cultivation
- Landscapes deforested prior to 2000
- Degraded soils, second growth forest

Restrict carbon credits to woody perennial biofuel species

- Oil palm, jatropha, eucalyptus

Use revenues from carbon markets to subsidize sustainable biofuels

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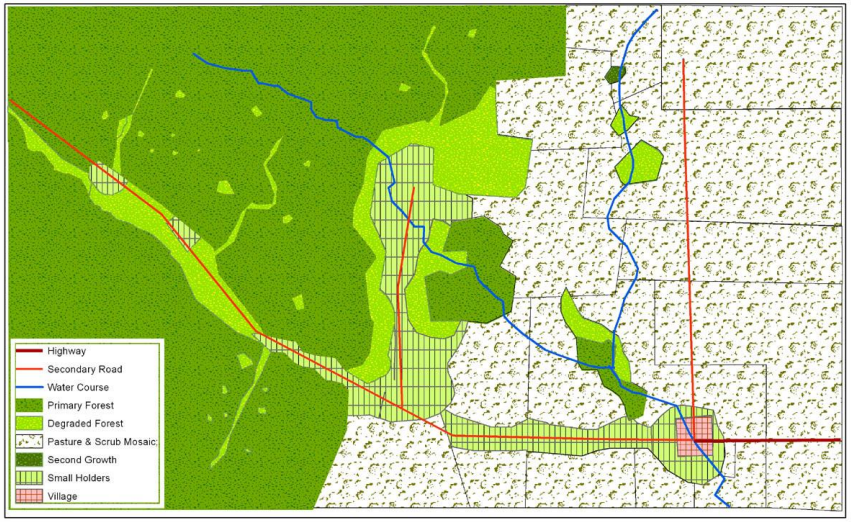
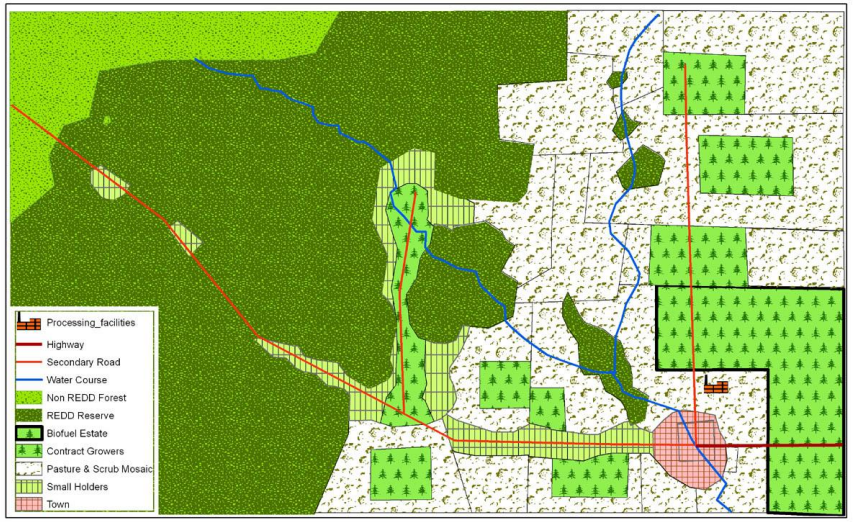
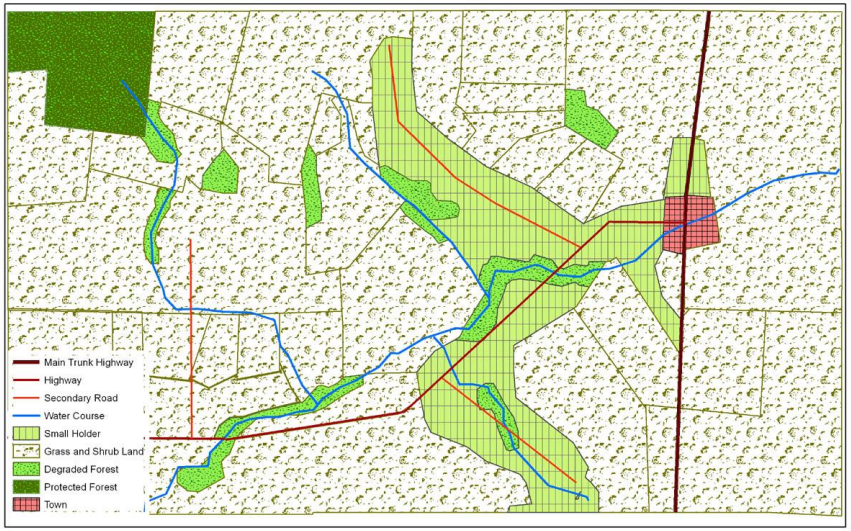
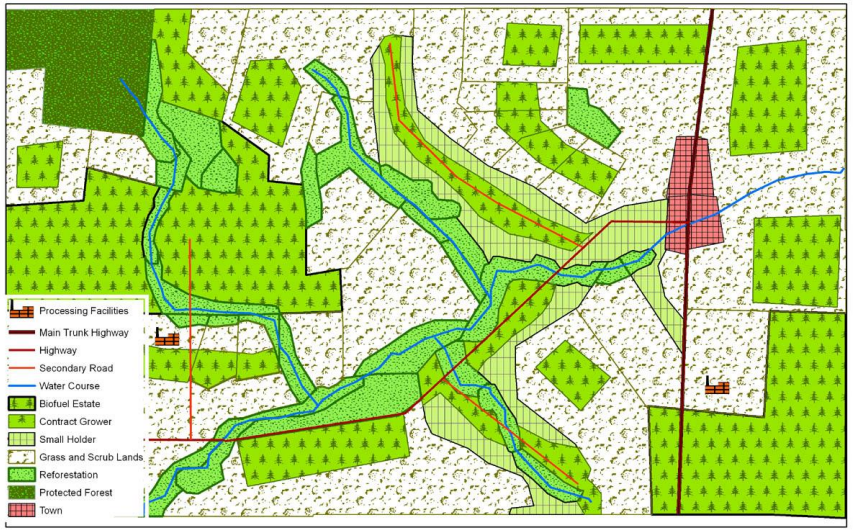
Biofuels + Forest Carbon Policy Proposal









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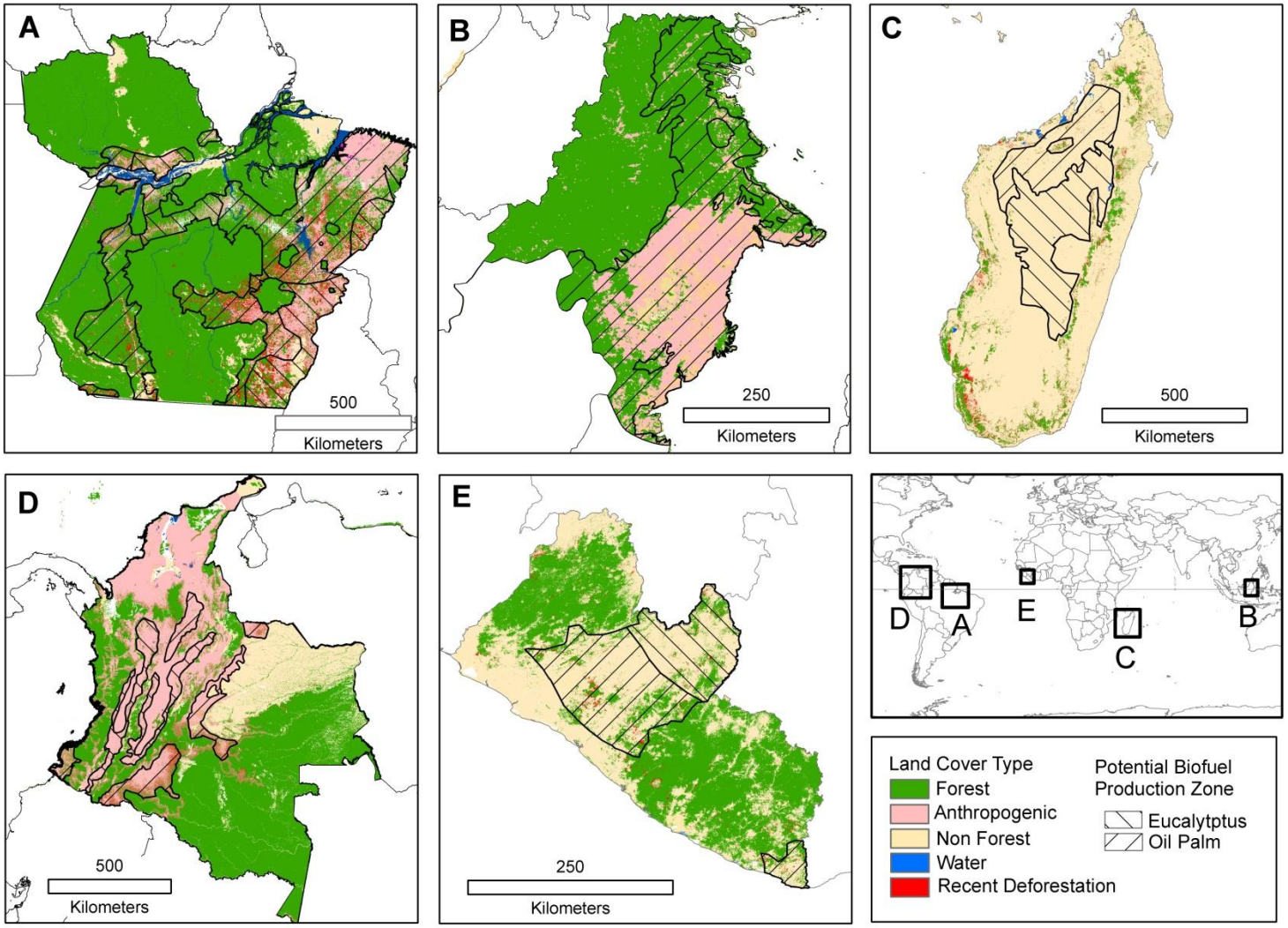
Conceptualize the model



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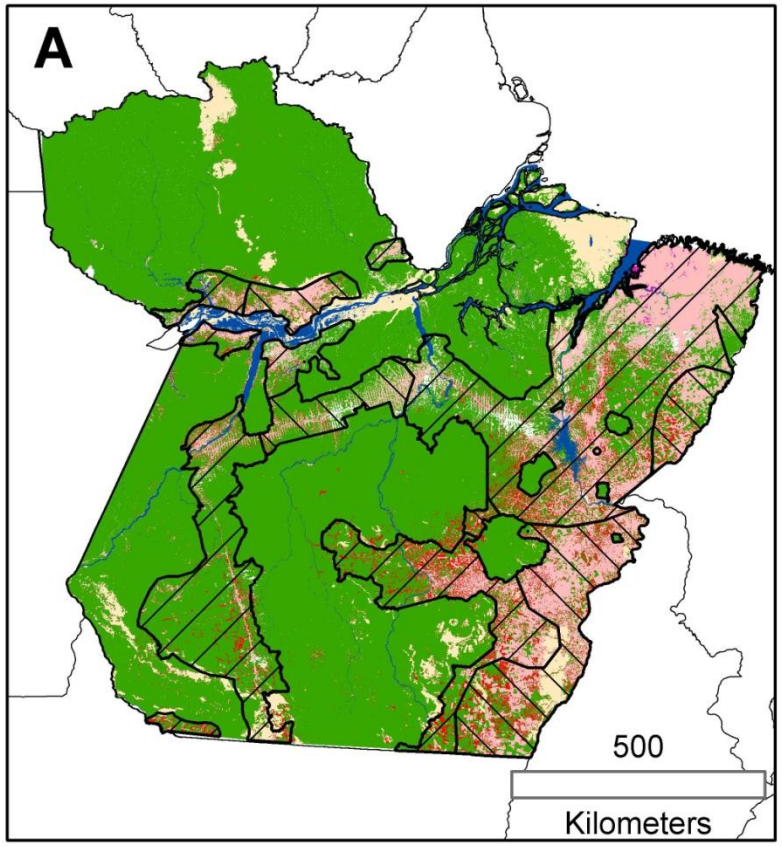
Spaitalize Policy Model for 5 Case Studies



Identify appropriate landscapes

Oil Palm: Precipitation > 2000 mm

Eucalyptus: Precipitation < 2000 mm

50% of anthropogenic landscape

Oil palm : 7.8 million ha

Eucalyptus: 3.9 million ha

Stratify by eligibility

REDD + Biofuels = 6.3 million hectares
(~10 years of deforestation)

RDL+ Biofuels = 5.5 million hectares

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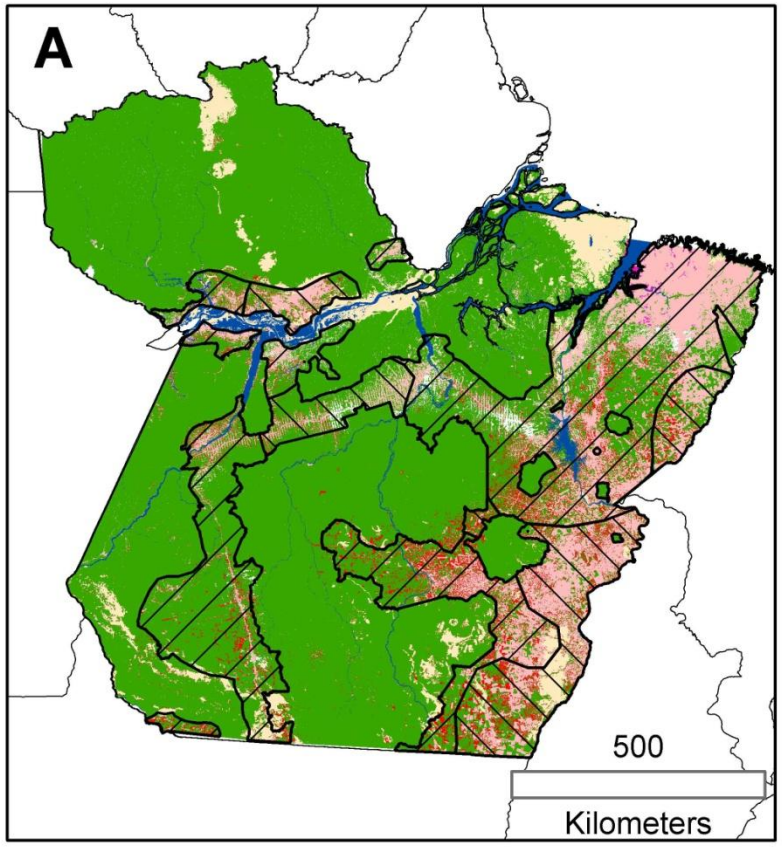
Pará- Brazil, Case Study



Forest Conserved

- 25 million hectares
- 29% of extant forest in Pará - Brazil

Landscape Reforested

- 556,000 hectares

Carbon Credits

- REDD = 9.2 billion tons CO2
- RDL = 168 million tons CO2
- Woody biofuels = 1.2 billion tons CO2

Biofuels Produced Annually

- 23 billion liters ethanol
- 18 million tons biodiesel
- 24% Brazilian oil consumption (2005)
- 2.9 % USA oil consumption
- $17 billion yr-1 (100% GDP 2005)

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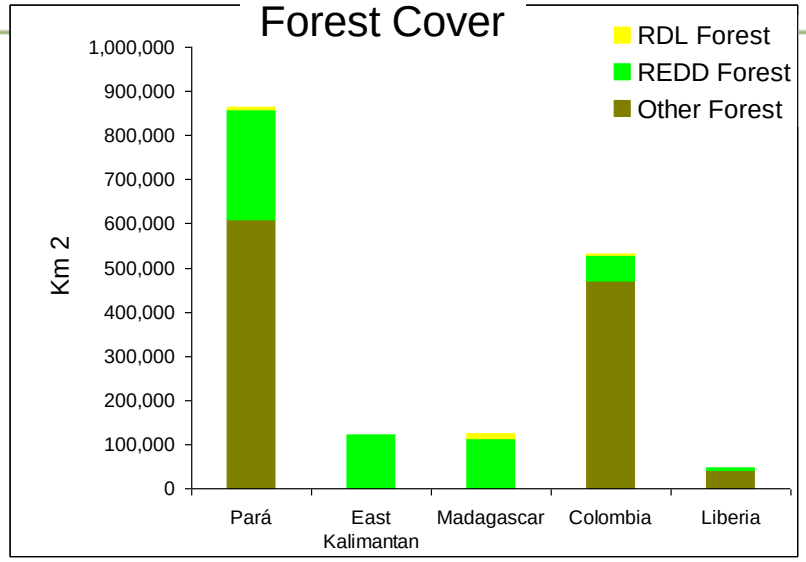
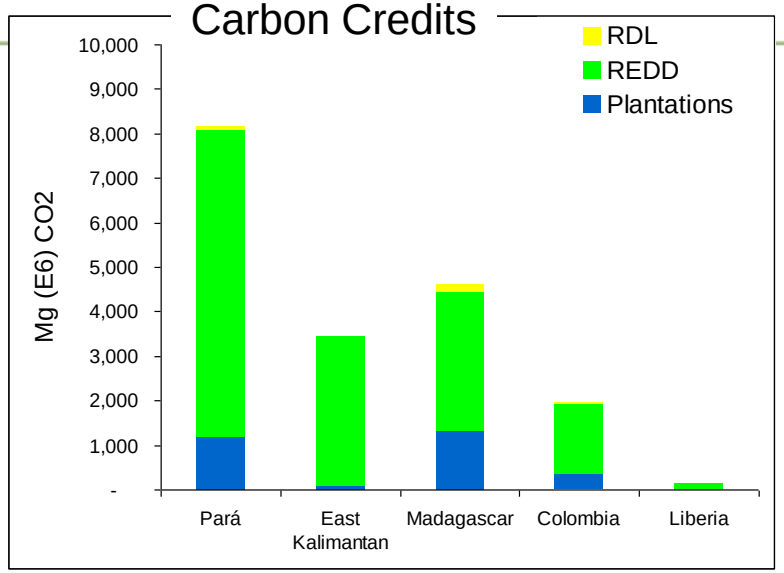
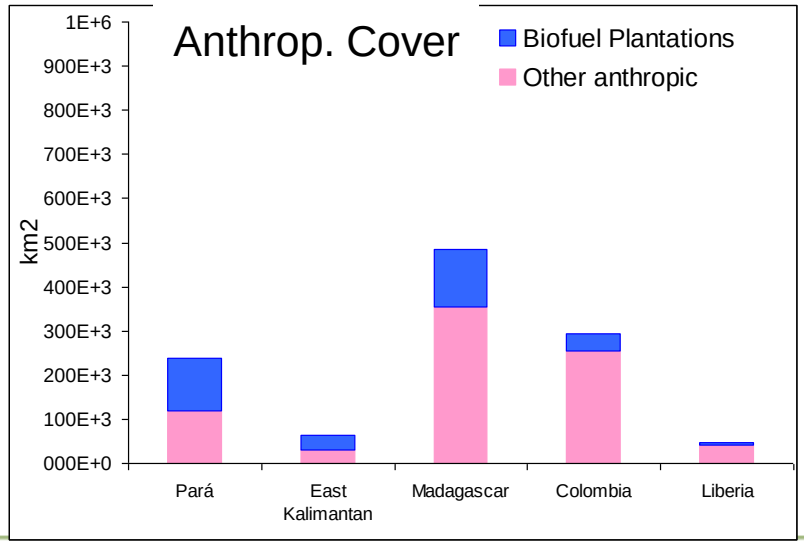
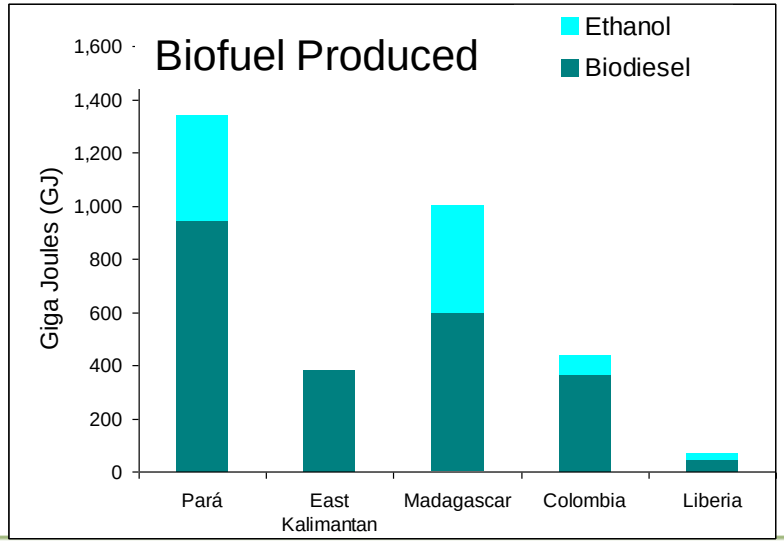
Pará – Brazil Case Study









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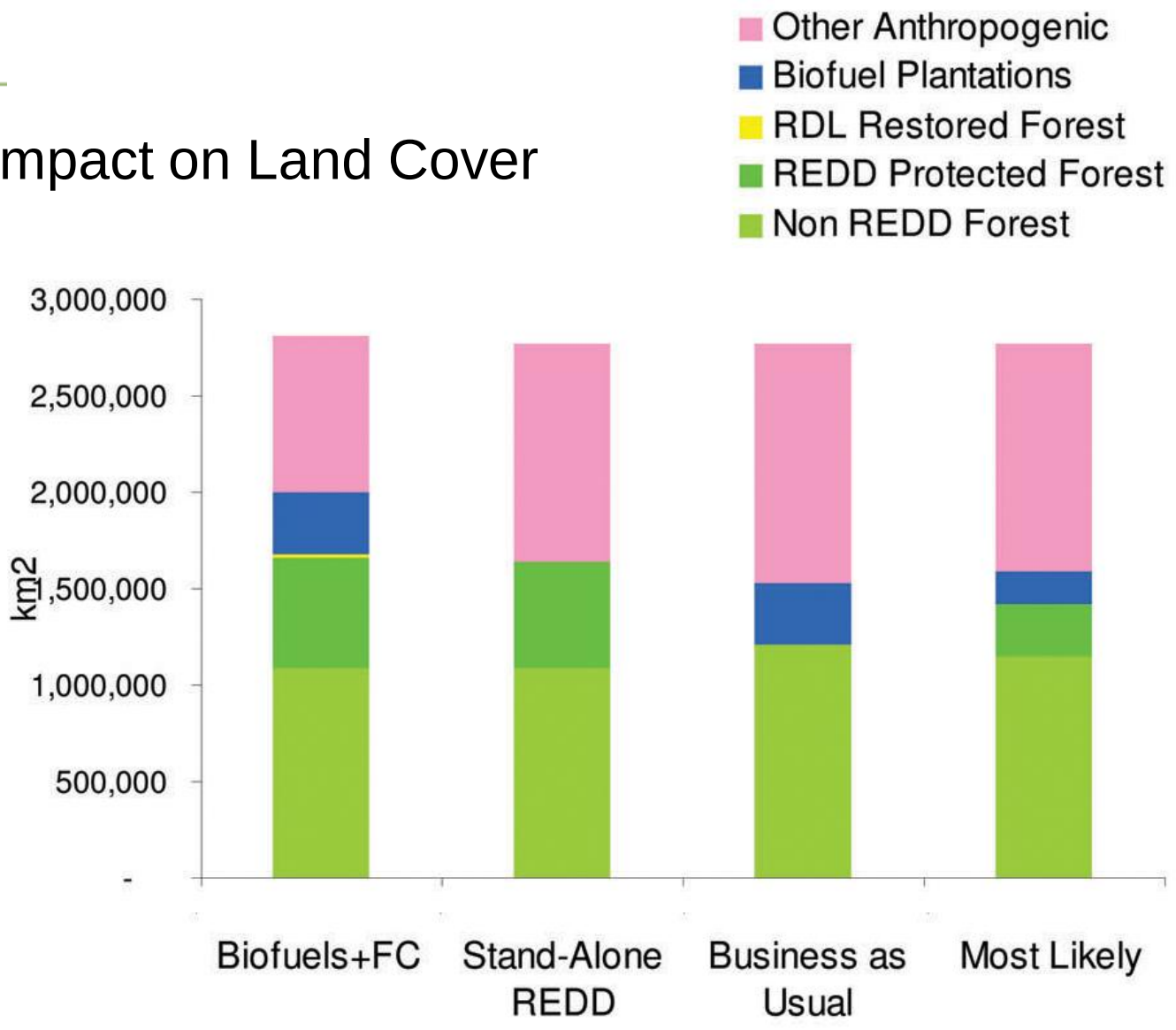
Potential Benefits

Impact on Land Cover



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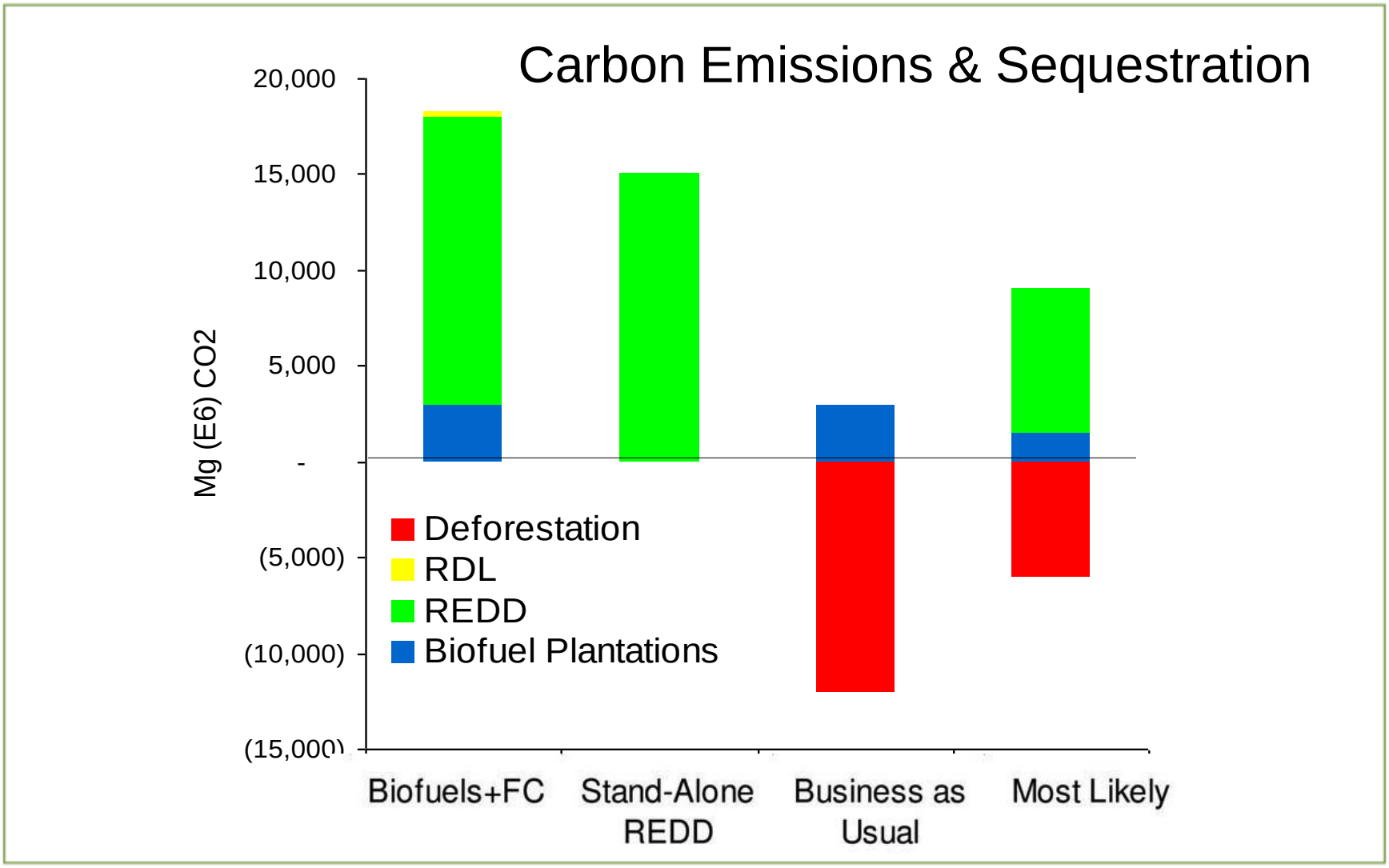
Counter Factual Policy Scenarios



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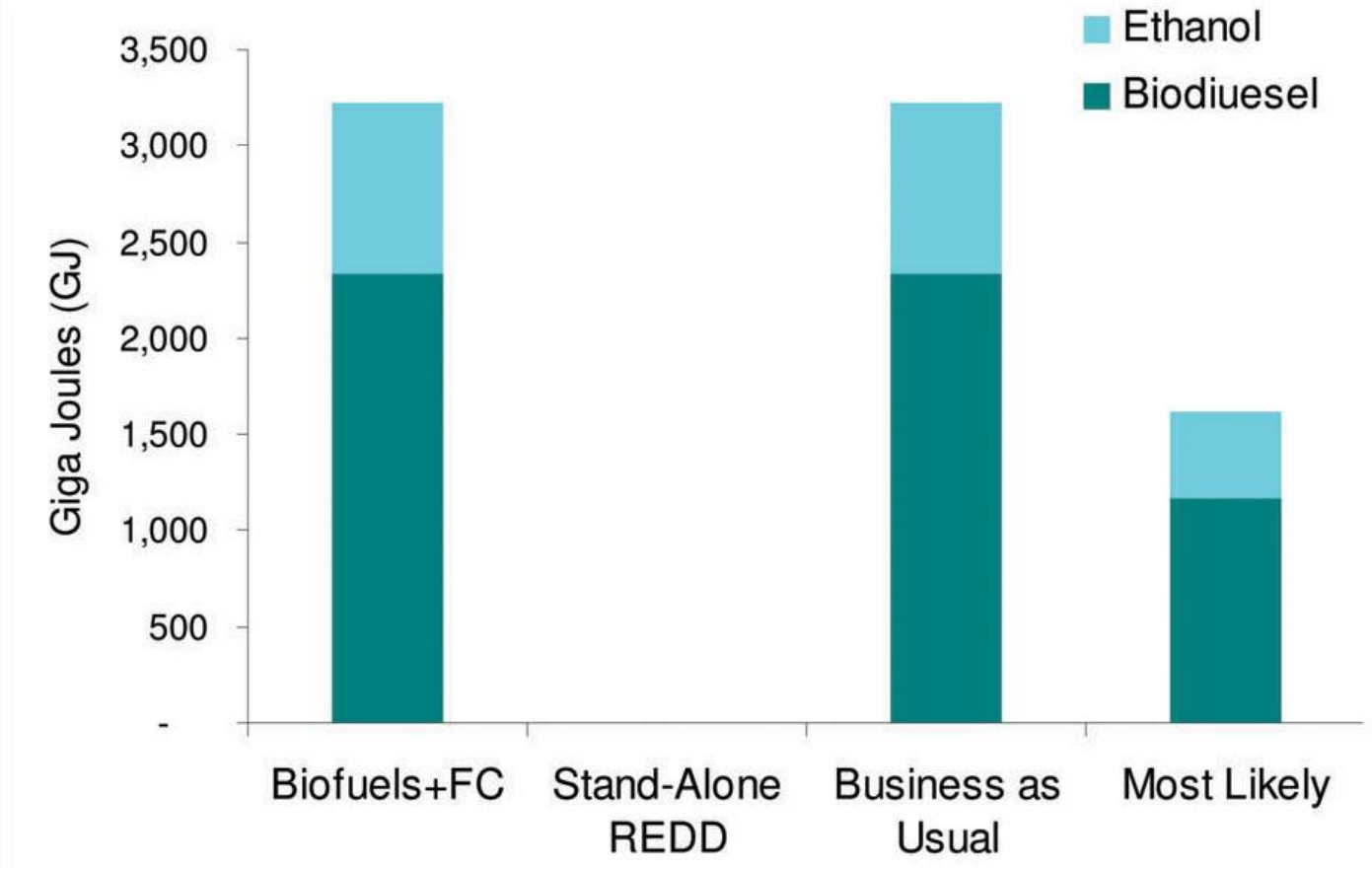
Counter Factual Policy Scenarios

Biofuel production



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Counter Factual Policy Scenarios

Reduce carbon emissions, conserve biodiversity, and promote economic growth in developing countries

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Scenario win-win-win