Assessing mitigation and adaptation options in an integrated modeling framework

The EC FP7 Project CC-TAME

www.cctame.eu

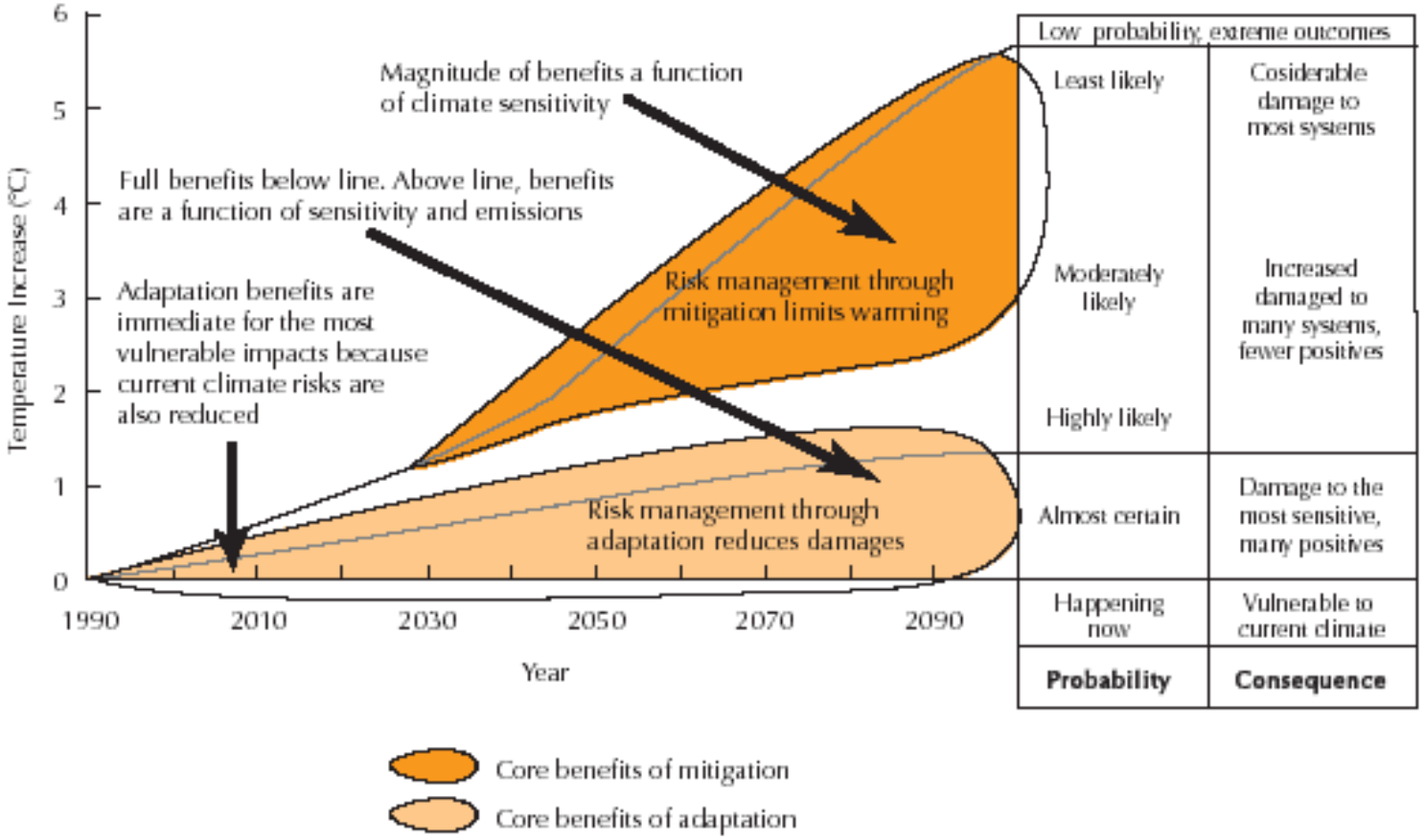
Presentation overview

1. Description of CC-TAME Project
    - Motivation
    - Concept
    - Expected results
2. Model framework applied to REDD & bioenergy
    - Model description
    - Illustrative outputs

Motivation

- Europe: LULUCF third largest GHG emitter
- Crop outages due to climate change and weather extremes
- Policy induced changes in land management
  - Increase the adaptive capacity of ecosystems
  - Reduce emissions
- Coordination of EU policies needed (CAP, Rural Development Strategy, EU Forestry Strategy, Clean Air and Water Policies)
- Potential for ancillary benefits and compliance cost reduction

Mitigation, Adaptation and Land-Use



www.greenhouse.gov.au/impacts/methods.html

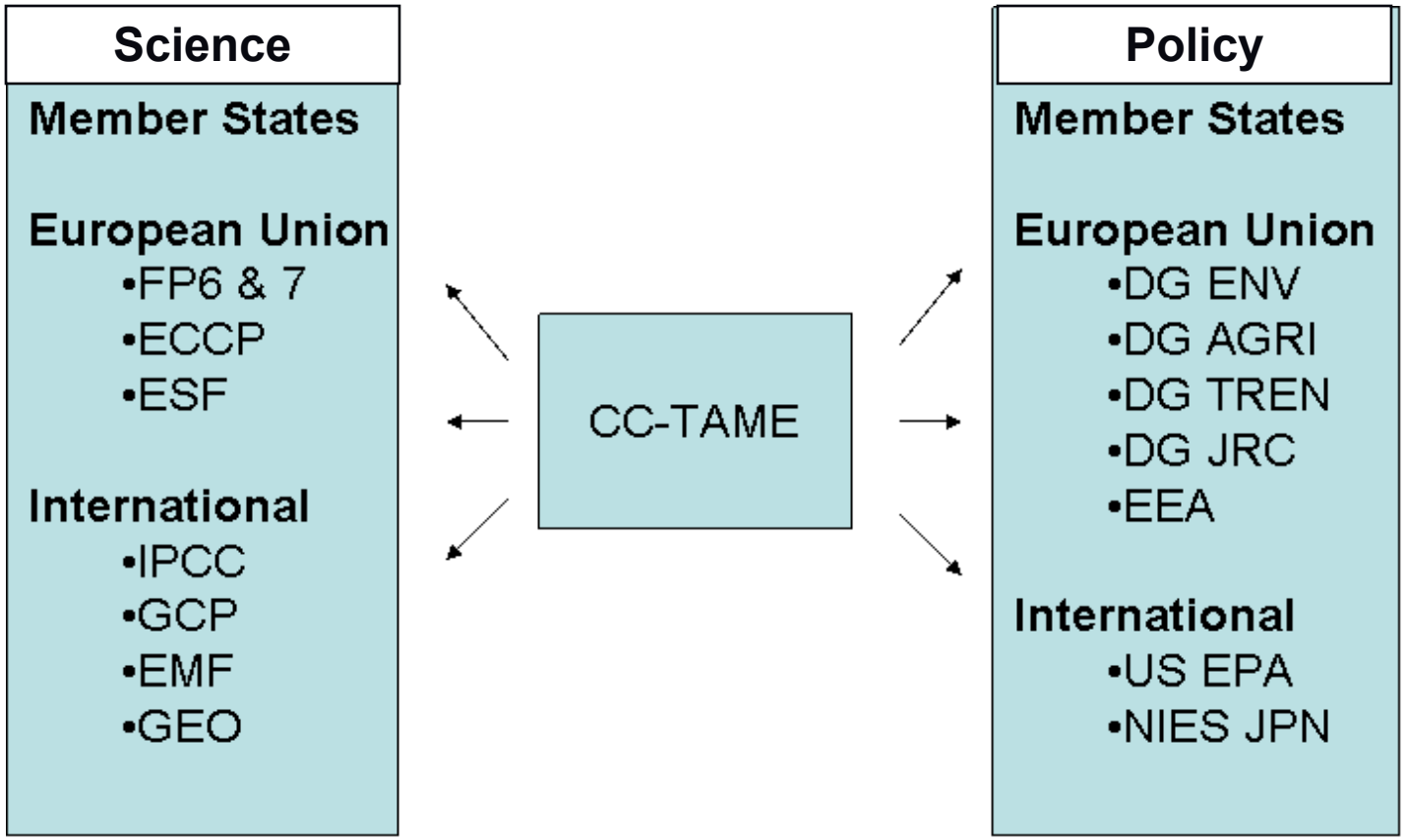
CC-TAME: Climate Change: Terrestrial Adaptation and Mitigation in Europe

- 3 year project.
  - financed by the European Commission's 7th Framework Programme (Theme 6, Environment)
- 17 participating institutions
- Goal: Provide assessments relevant to post 2012 policy selection.
- MEANS: Integrate state-of-the-art, data-rich, geographically explicit LULUCF models

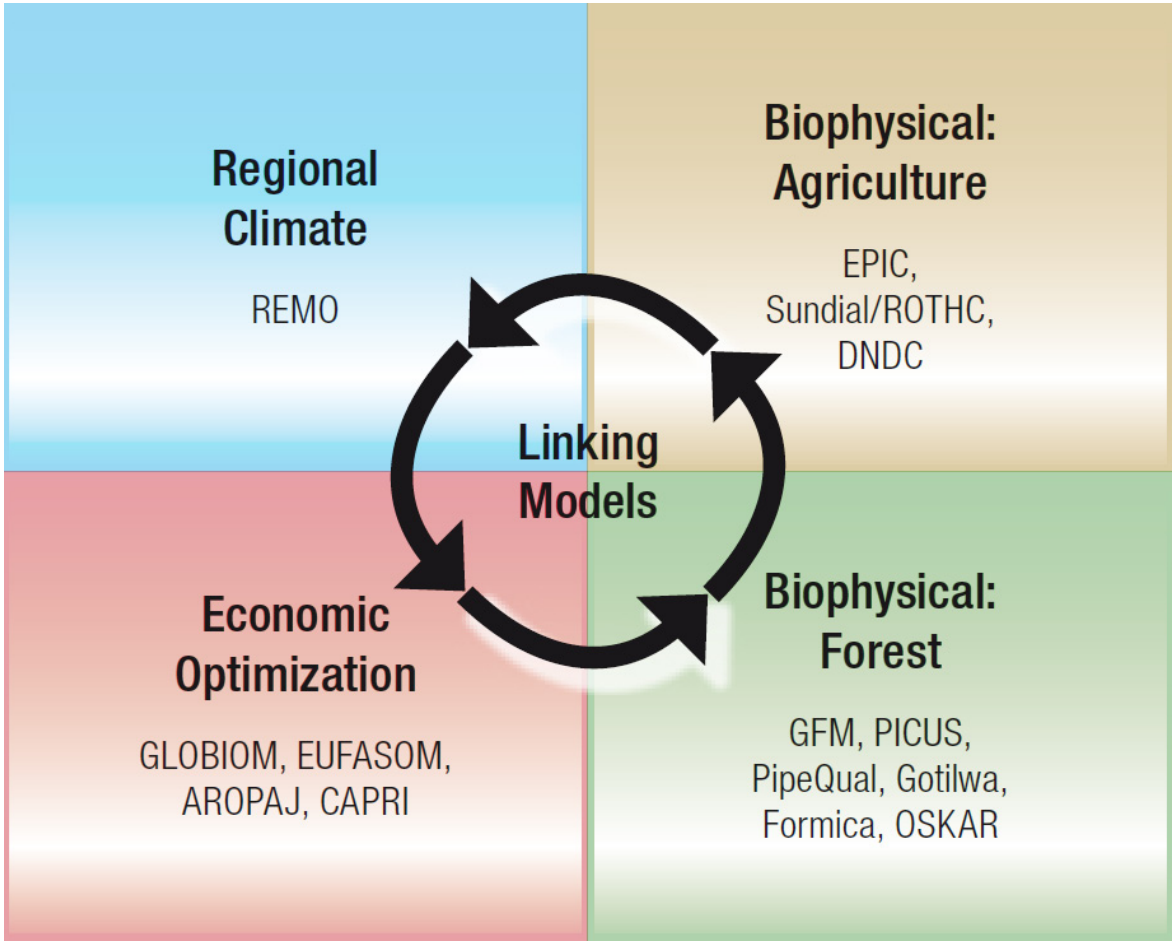
Climate Change – Terrestrial Adaptation and Mitigation in Europe

- Evaluation of land-use options with respect to mitigation and adaptation
- Assessment of impacts of agricultural, climate, energy, forestry and other associated land-use policies
- Considering feed-backs of the climate system
- Implementation of a "Science-Policy Fusion" concept
  - efficient and effective mitigation and adaptation in the land-use sector
  - maximization of benefits from policy coordination

CC-TAME concept: Science-Policy Fusion



Link climate, biophysical & economic models



Expected Results of CC-TAME

- EU policy support:
  - Resource potential maps (e.g. biomass for bioenergy, carbon maps)
  - Trade-off analysis (e.g., sequestration versus bioenergy)
  - Impact of land-based carbon market (include LU reductions in EU ETS*)
- International negotiations:
  - Implications of EU bioenergy targets
  - Cost curves for adaptation and mitigation options

* EU Emission Trading Scheme

Modelling example from CC-TAME

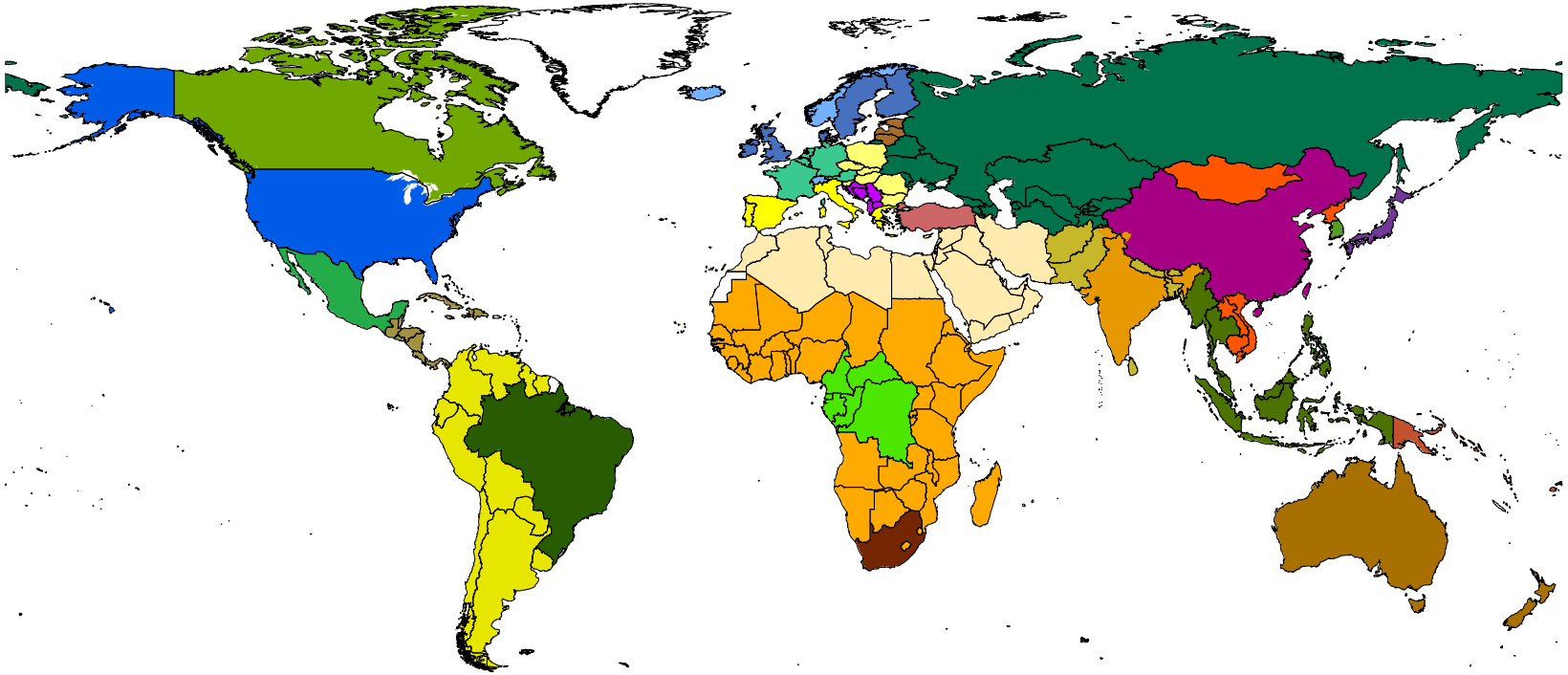
1. Examples: connecting bioenergy & land use
2. Questions that might be addressed
3. Request for most important questions from stakeholders

Introduction

- Bioenergy and avoided deforestation considered as potential mitigation options
- For their implementation policies play an important role:
  - biofuel policies (scale of production)
  - trade policies (e.g. certification)
  - environmental policies (REDD)
- → Integrated and global modeling approaches necessary for assessment

GLOBIOM: Global Biomass Optimisation Model

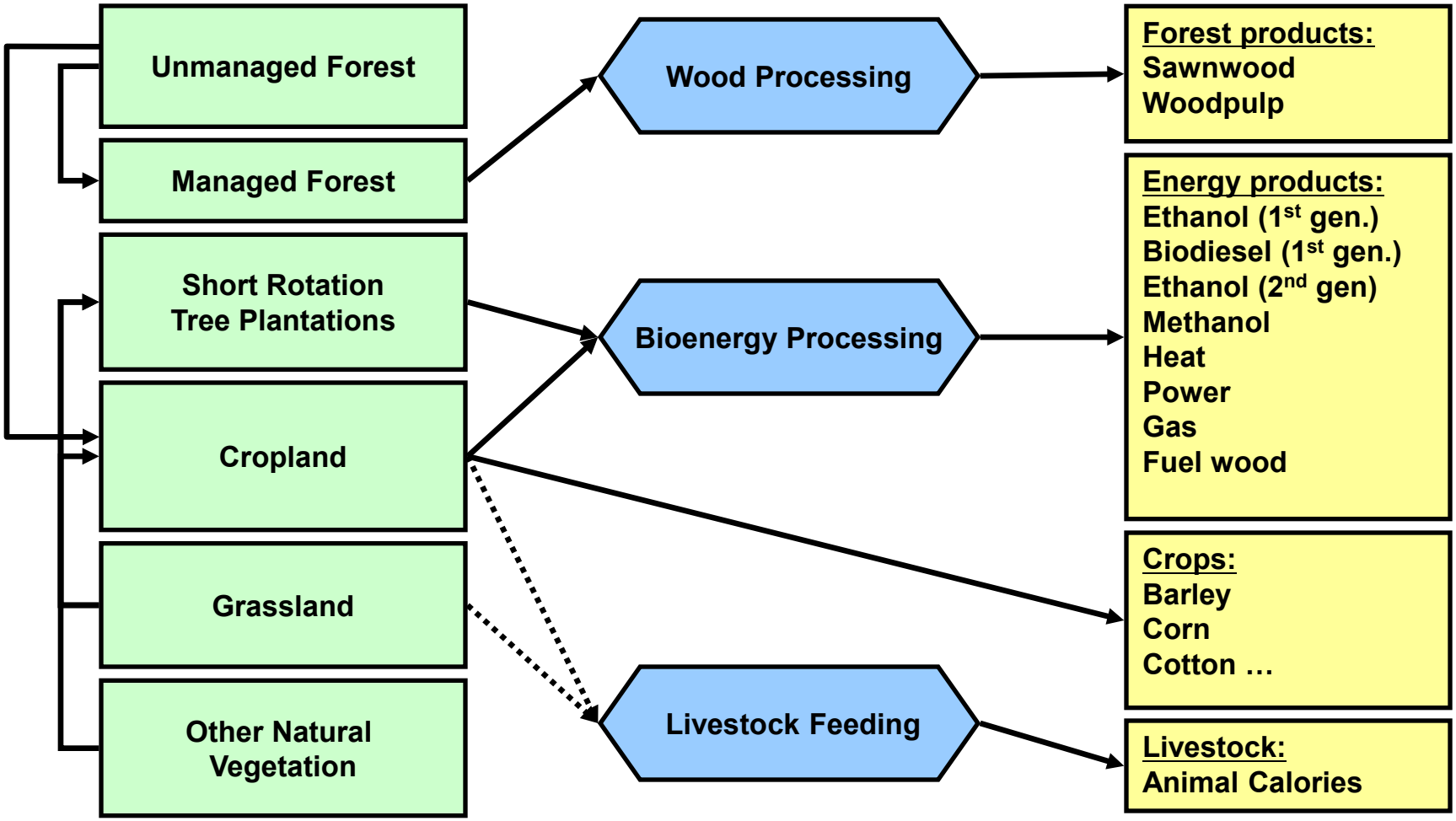
Integrated land-use and bioenergy modelling
World divided into 28 regions



Considered land-use categories

- Forests
  - Production forests (wood, pulp & paper production)
  - Unmanaged forests
- Agriculture
  - Major agricultural crops,
  - Generalized livestock production
- Bioenergy
  - Conventional crops
  - Dedicated forest plantations

Supply chains

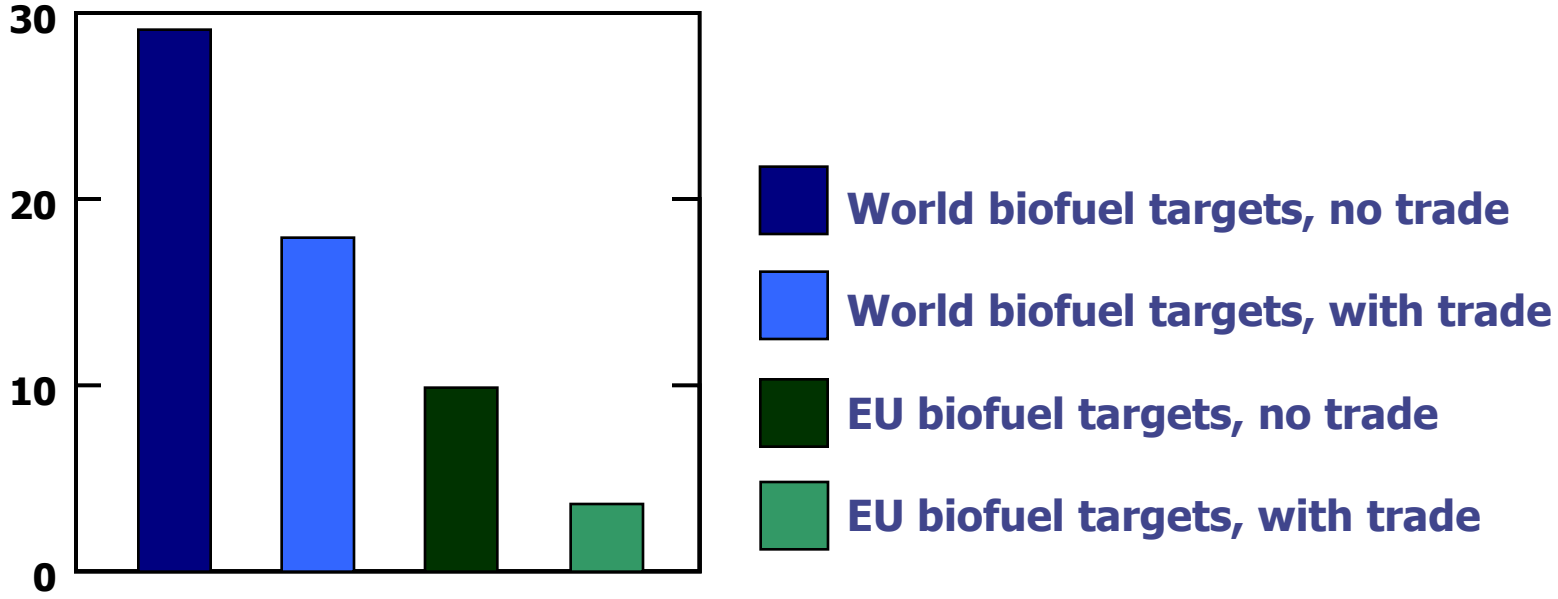


Model parameters & assumptions

- Time horizon: 2000–2020
- Basic drivers (population, diet, GDP, etc.)
- Policy scenarios:
  - Bioenergy mandates (in 2020 WEO, 2008)
  - Trade/no trade (import charges, certification)
  - Deforestation/no deforestation (REDD)

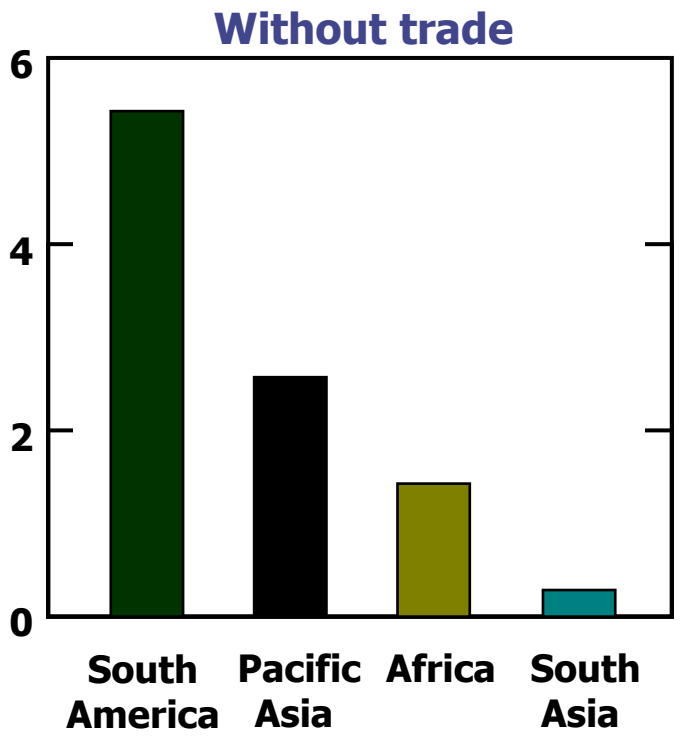
Deforestation due to biofuel expansion

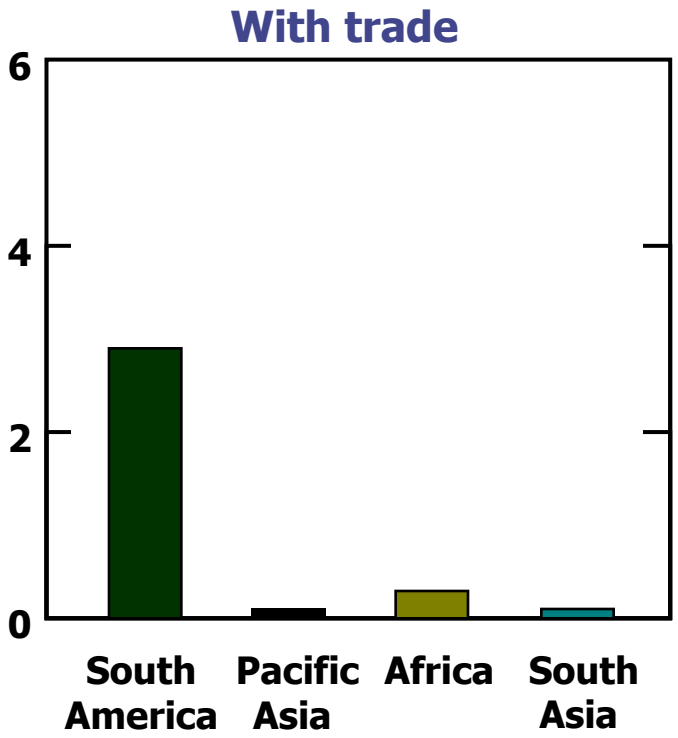
Mha, based on WEO 2020 targets,
If not constrained (e.g. by REDD) important deforestation occurs



Deforestation due to EU biofuel expansion

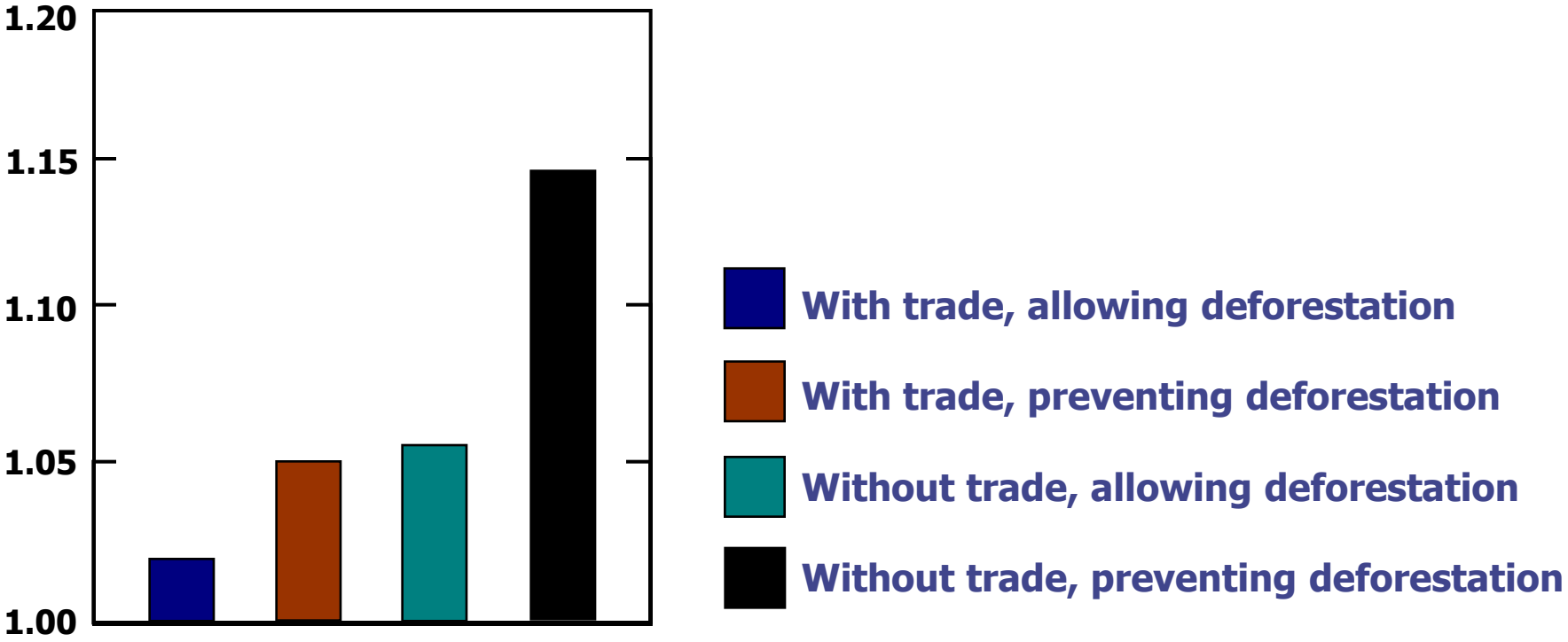
In Mha, EU mandates in 2020 put pressure on deforestation elsewhere even without trade – iLUC!





World biofuel expansion and crop prices

Crop price index, avoiding deforestation further increases the effect of biofuels on crop prices



Conclusions

- Biofuel expansion generates important indirect (i)LUC GHG emissions
- Trade lowers global deforestation pressure by iLUC
- Dimension of iLUC depends more on efficient sourcing of biofuels than on the global scale of production
- Policies (like REDD) aiming at (i)LUC effects will put pressure on crop prices
- How will management systems adapt?

CC-TAME Consortium

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CC-TAME – CLIMATE CHANGE: TERRESTRIAL ADAPTATION & MITIGATION IN EUROPE

More INFO www.cctame.eu

The CC-TAME project concentrates on assessing the impacts of agricultural, climate, energy, forestry and other associated land-use policies considering the resulting feed-backs on the climate system in the European Union.
CC-TAME's international consortium is composed of 17 highly recognized multi-disciplinary science partners who will carry out the project during 2008 — 2011.

For more information download the
- **CC-TAME Project Summary Flyer**
- *CC-TAME Policy Flyer*

from our web page www.cctame.eu

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COOPERATION

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CC-TAME is a follow-up project of INSEA which focused on integrated sink enhancement assessment and related policies (2004 – 2007, www.insea-eu.info)