



# BIOMASS FUTURES

## The role of biomass in meeting a diversified demand – Sharing final results from the Biomass Futures project Global results

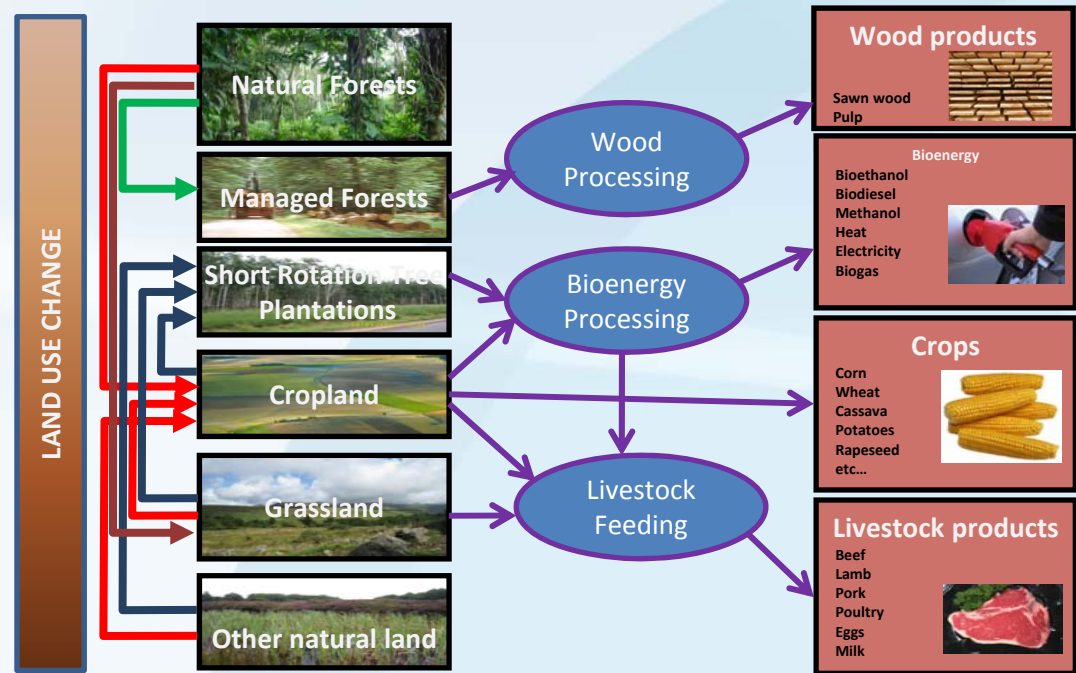
Stefan Frank, Hannes Böttcher, Petr Havlík et al.  
International Institute for Applied Systems Analysis

Brussels, March 20, 2012



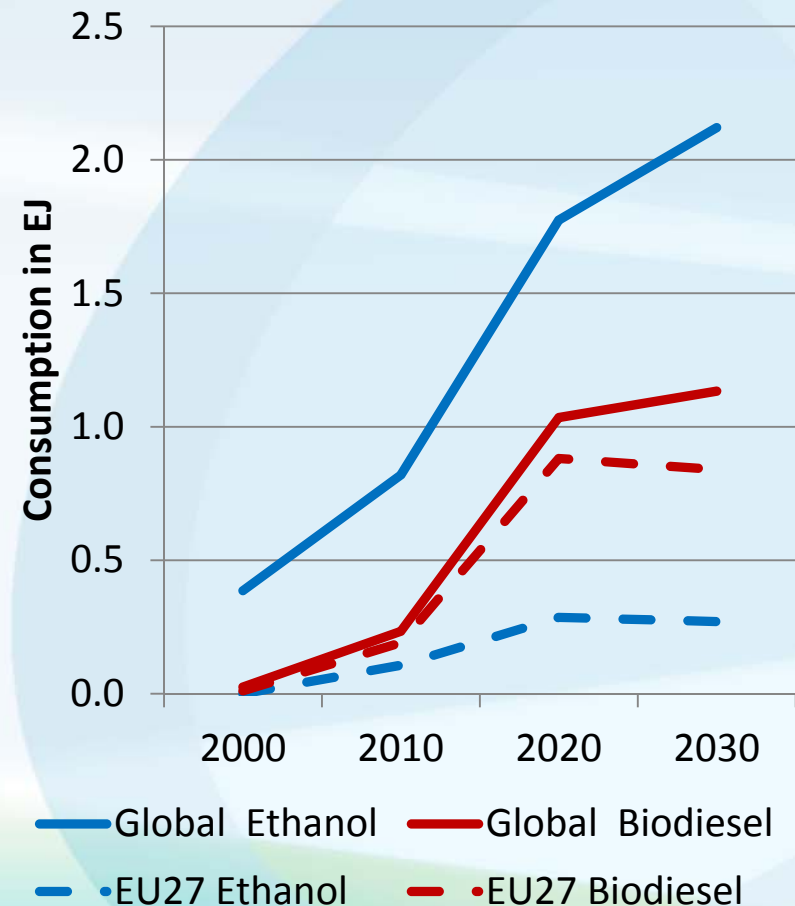
# Global assessment assumptions

- GLOBIOM developed by IIASA
- Recursively dynamic partial equilibrium model of the agricultural, bioenergy, forestry and livestock sector
- Covering 28 world regions (plus EU27)
- Demand for rest of the world: POLES Reference scenario
- Deliverables for Biomass Futures:
  - Imports for demand models
  - Impacts of imports and scenarios of biomass use (water and Nitrogen use, GHG emissions, deforestation)



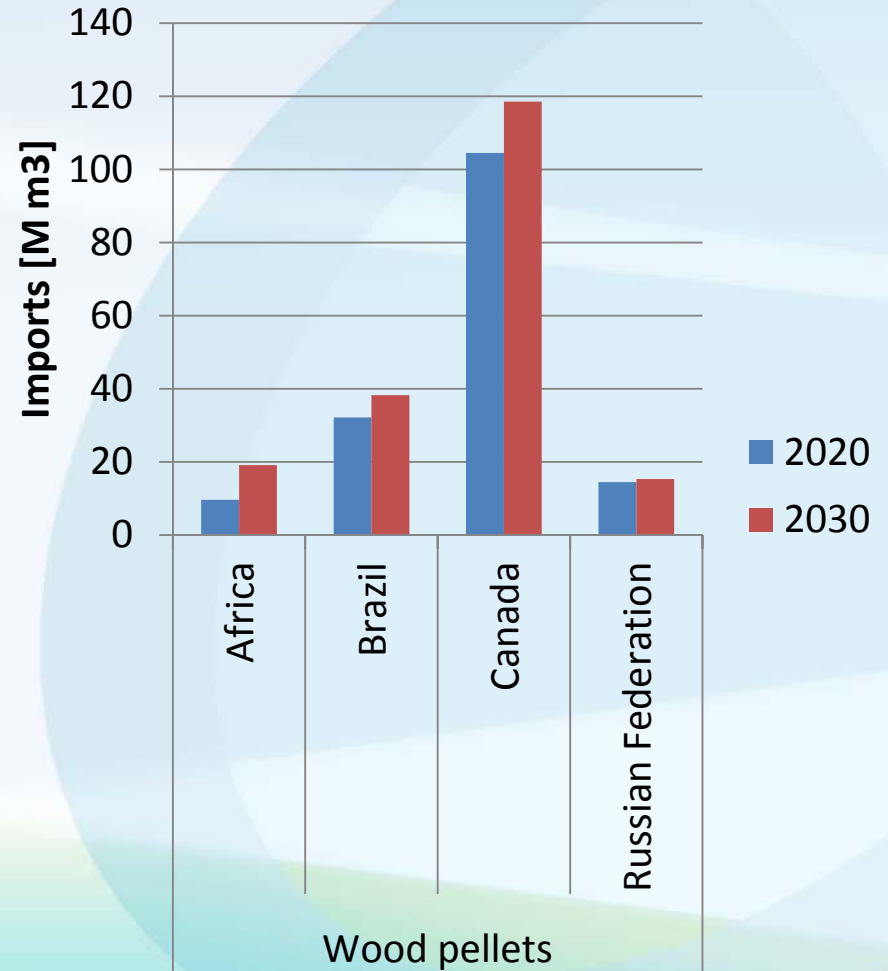
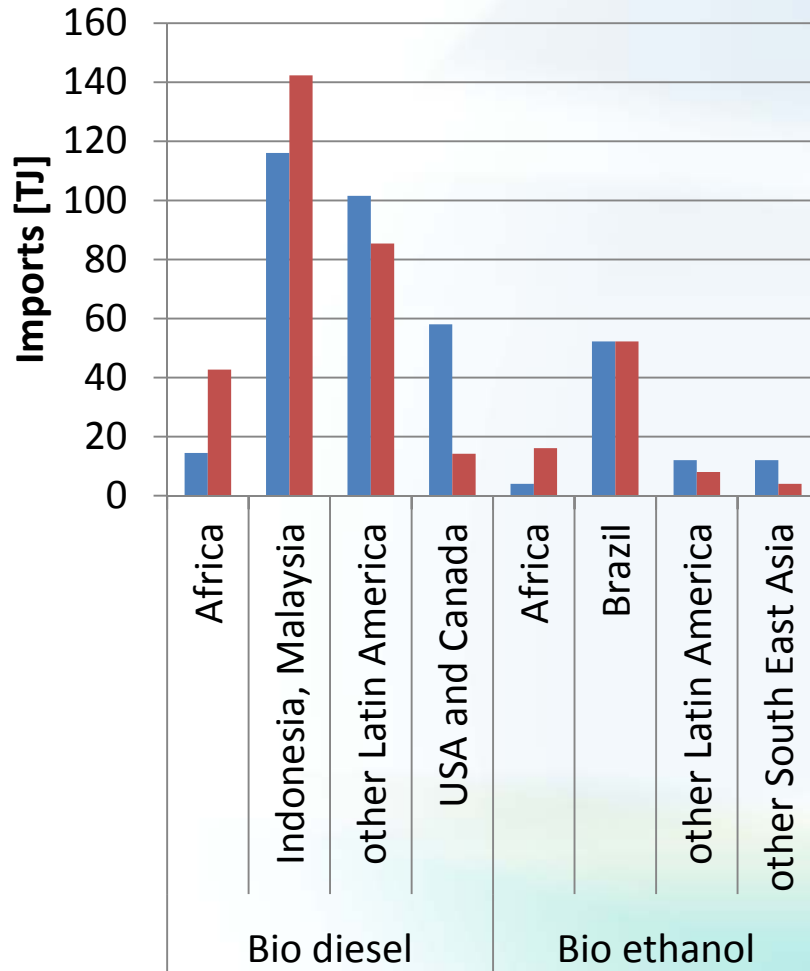
# Global versus EU biofuel consumption

- Share of European biodiesel of global demand increases from 42% in 2000 to 74% in 2030
- EU ethanol share is also rising to 13% of global demand in 2030
- Other countries such as Brazil and the US continue expansion of production

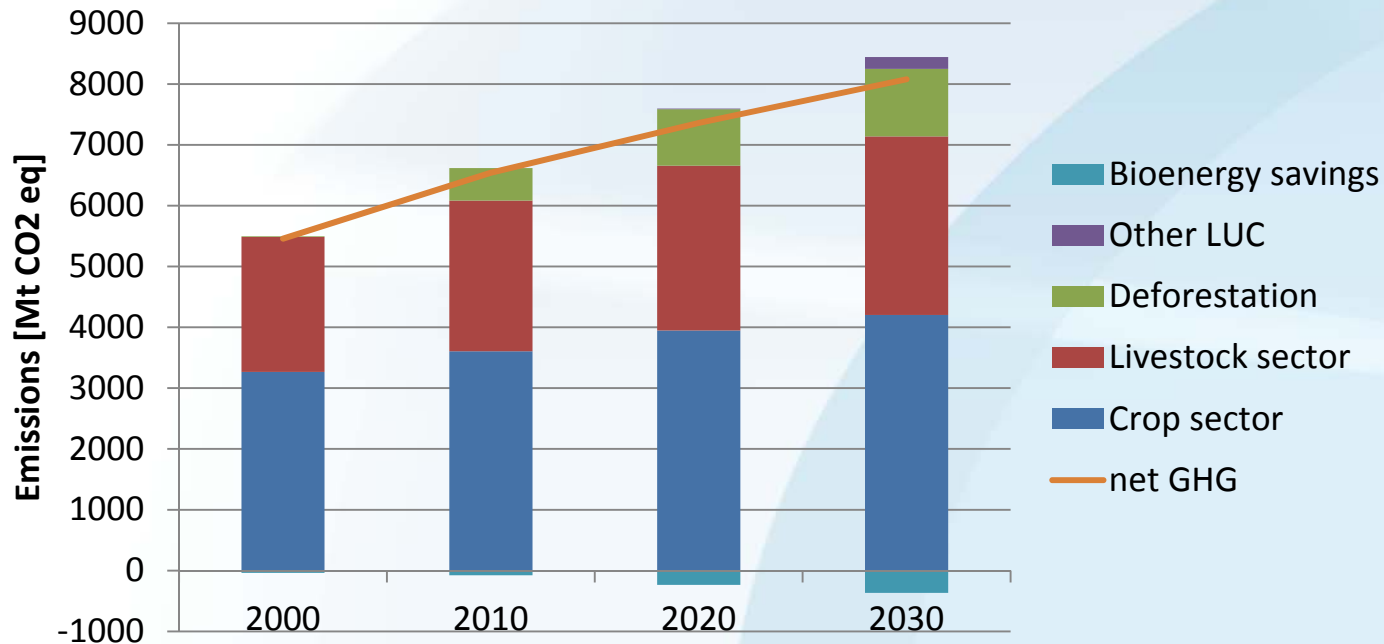


# Results: Import quantities and origin

Excluding sustainability criteria, to be added ex post before entering demand



# Impacts: Global GHG emissions



Global GHG emissions in Reference scenario in Mt CO2 eq

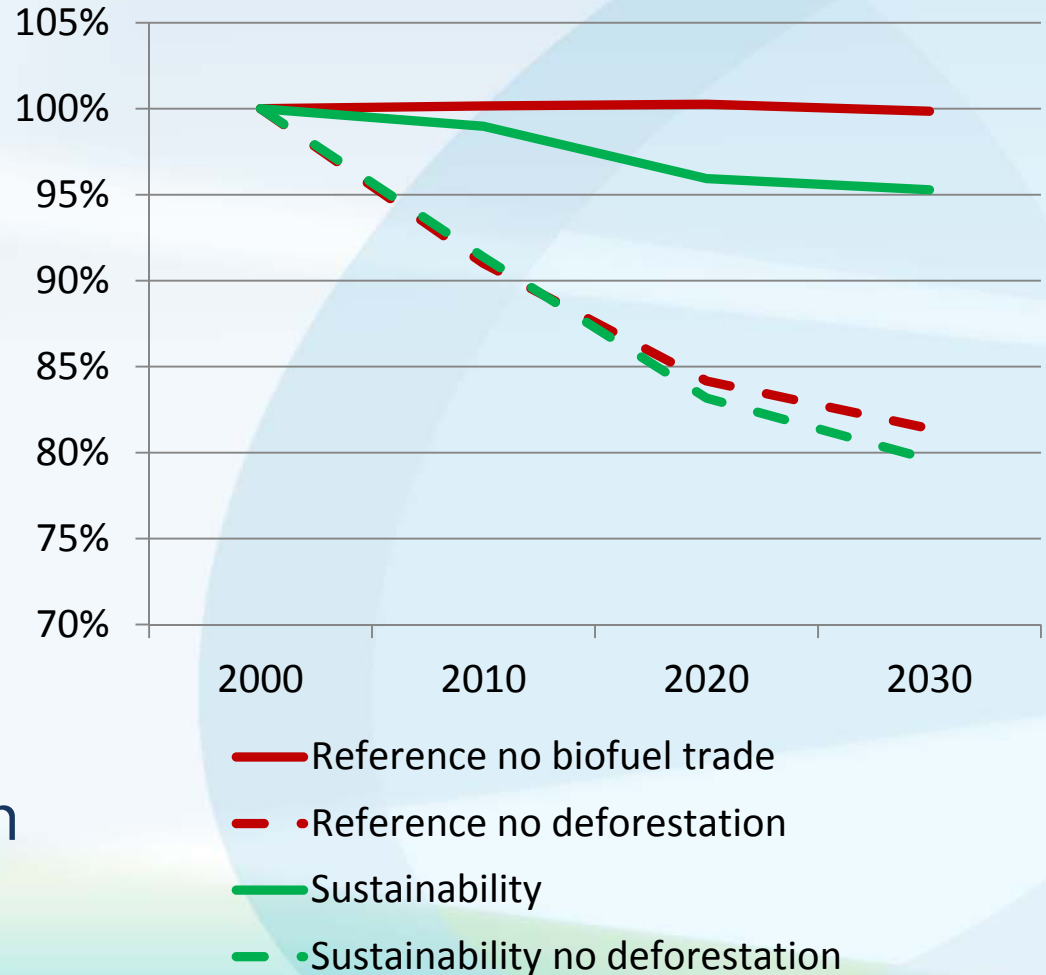
- Globally increasing GHG emissions in Reference scenario
- Population and GDP are largest drivers
- Main source for additional emissions of biofuels is due to deforestation and other land use change

## How to assess direct and indirect impacts?

- Biomass Futures scenarios
  - Reference (RED policy)
  - Sustainability (more stringent criteria)
- Commodities in model considered to be homogenous, i.e. products from all regions are identical and substitutable
- Similar to real situation of leakage: sustainable feedstocks potentially used for EU biofuels, remaining sources supply to other sectors and regions
- In addition to scenarios: model exercises to assess effects of
  - no trade of biofuels between EU and RoW (but allowing food trade)
  - effectively avoided deforestation (of all kind)

# Total GHG emissions in sensitivity runs

- Development of total global GHG emissions relative to Reference scenario
- Not allowing biofuel trade has no mitigation effect
- Additional sustainability constraints have limited effects
- Most effective: targeting deforestation directly (e.g. through REDD policies)



# Main observations

- Satisfying European bioenergy targets in 2020 and 2030 requires a substantial increase in imports from the rest of the world
- EU biofuel mandates do have an effect on global land use and emissions (indirect effects)
- These land use effects are most effectively mitigated through direct land use policies e.g. targeting emissions from deforestation and biodiversity loss (e.g. REDD)
- Such policies need to target total agricultural production
- Risk of undesirable social effects (food prices)