

Workshop: Forests, forestry and carbon balances: importance of policies and forest sector responses

March 27, 2024

# Role of AFOLU sector in meeting short and long-term mitigation targets

Integrated Biosphere Futures (IBF) Research Group

Biodiversity and Natural Resources (BNR) Program, IIASA

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# Where to store the carbon – a Swiss case study

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# Where to store the carbon?



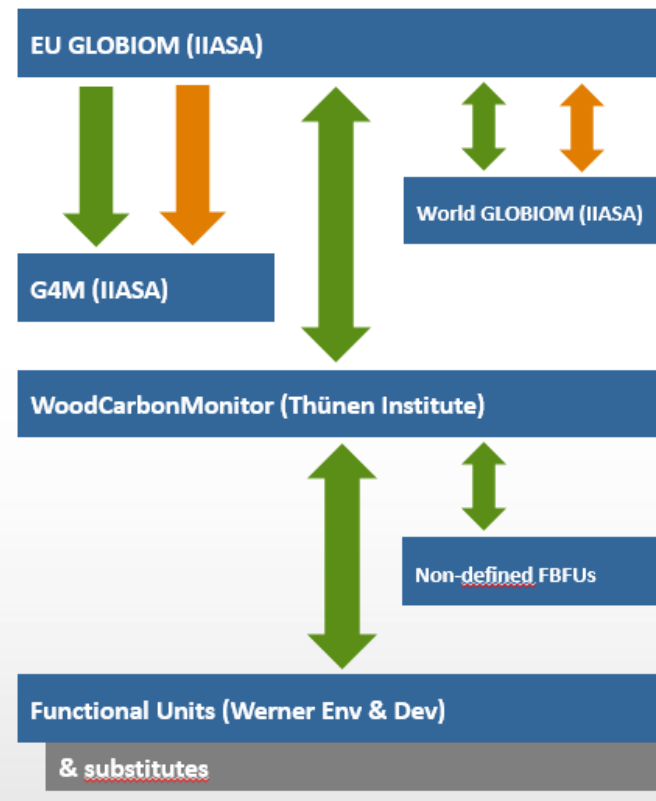
ClimWood2030  
 'Climate benefits of material substitution by forest biomass and harvested wood products: Perspective 2030'

Final Report

Sebastian Rüter, Frank Werner, Nicklas Forsell, Christopher Prins, Estelle Vial, Anne-Laure Levé

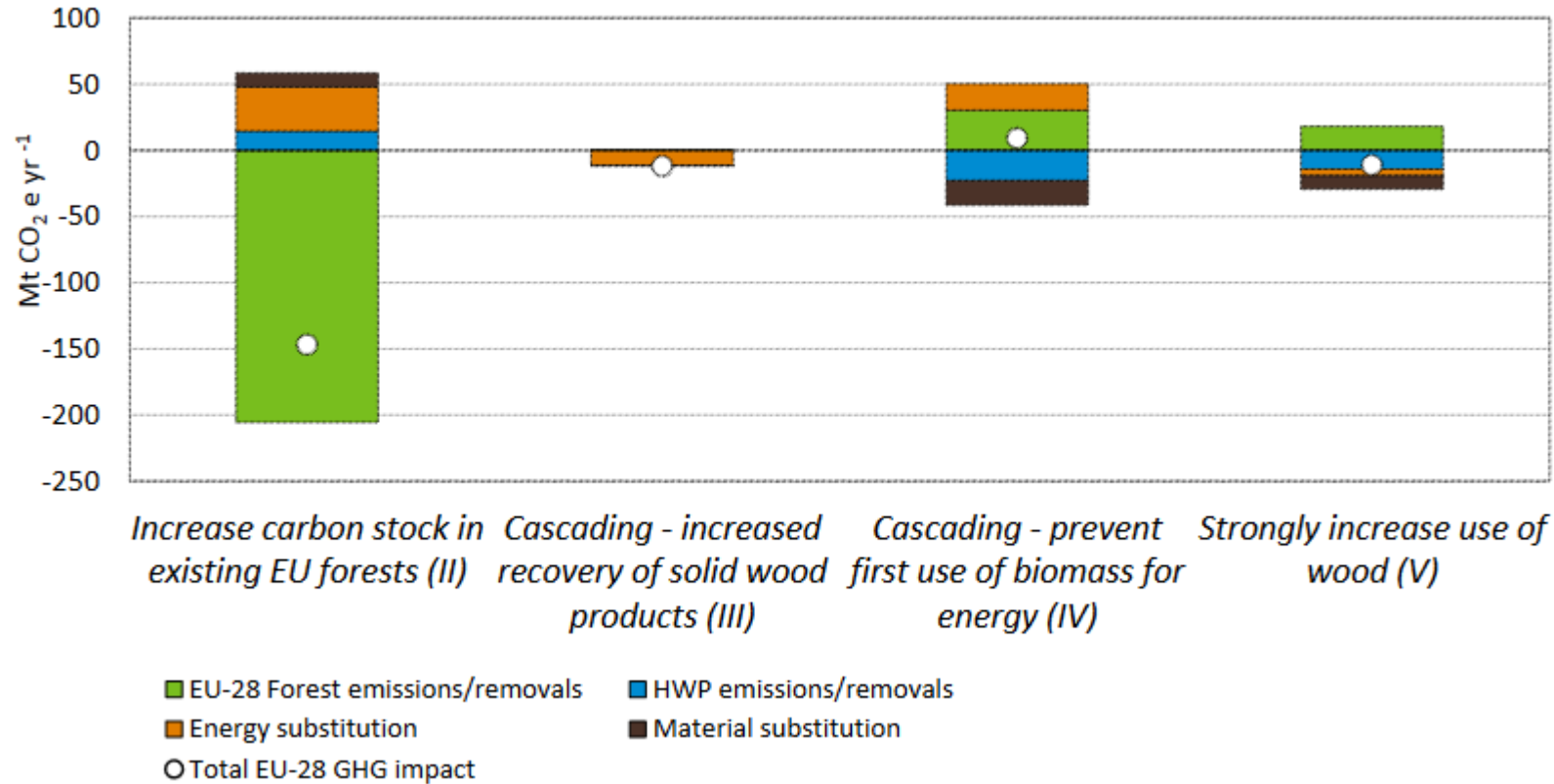
Thünen Report 42

## Model framework including consistent scenarios across all levels



- **GLOBIOM: Global economic forest & agriculture equilibrium model (supply/demand calculations)**
- **G4M: Global biophysical model to describe growth and decay of forest biomass (forest carbon model)**
- **WoodCarbonMonitor: Country specific HWP spreadsheet model to estimate net-emissions of material wood usage**
- **FBFUs: Model to determine displacement factors and indices based on life cycle assessment methodology**

# Where to store the carbon?



Annual average impact of scenarios for EU-28 parameters on GHG balances as compared to the *ClimWood2030* reference scenario, period 2021-2030, detailed per contributor [in Mt CO<sub>2</sub>e yr<sup>-1</sup>].

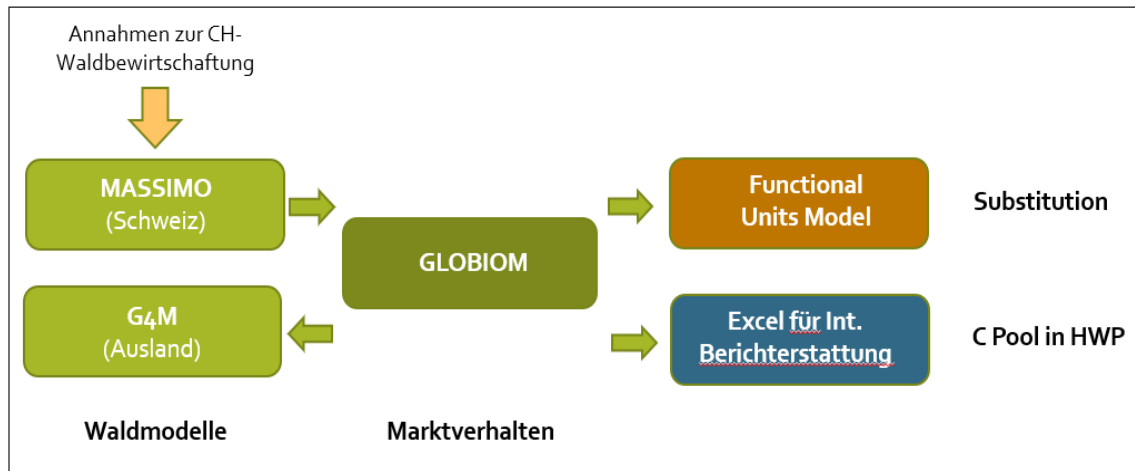
Source: Rüter et al. 2016

# Swiss assessment of climate, forest management and wood use

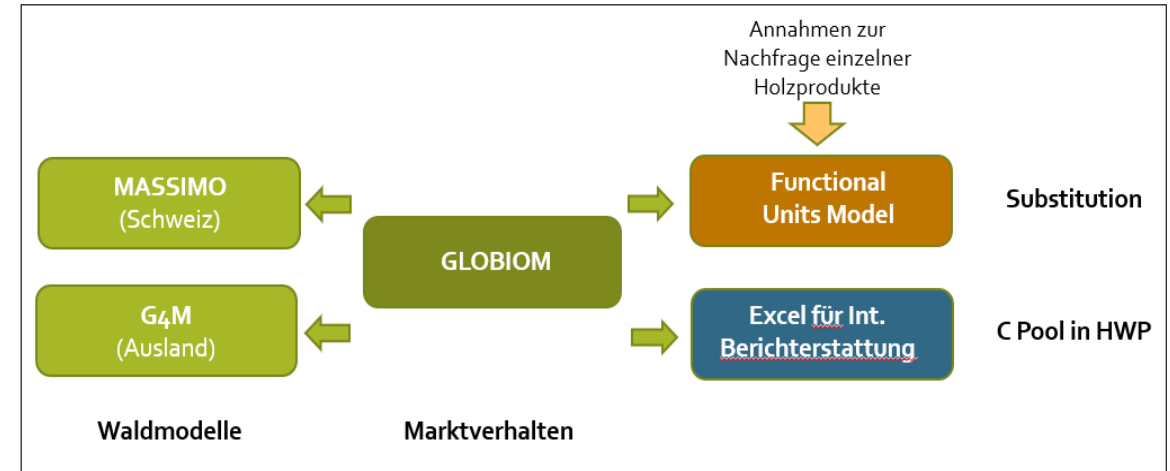
- ▶ Main aims of the assessment:
  - ▶ Assess the potential future contribution of the forest sector in terms of carbon removal, storage in woody productions and substitution effects.
  - ▶ Modelling tools used for the assessment:
    - ▶ Applied MASSIMO to project the development of forests in Switzerland
    - ▶ Use GLOBIOM to project international trade and G4M to calculate carbon effects outside of Switzerland
    - ▶ Calculate C in HWP following IPCC guidelines
    - ▶ Calculate material and energy substitution using detailed Functional Units

# Main scenario construction

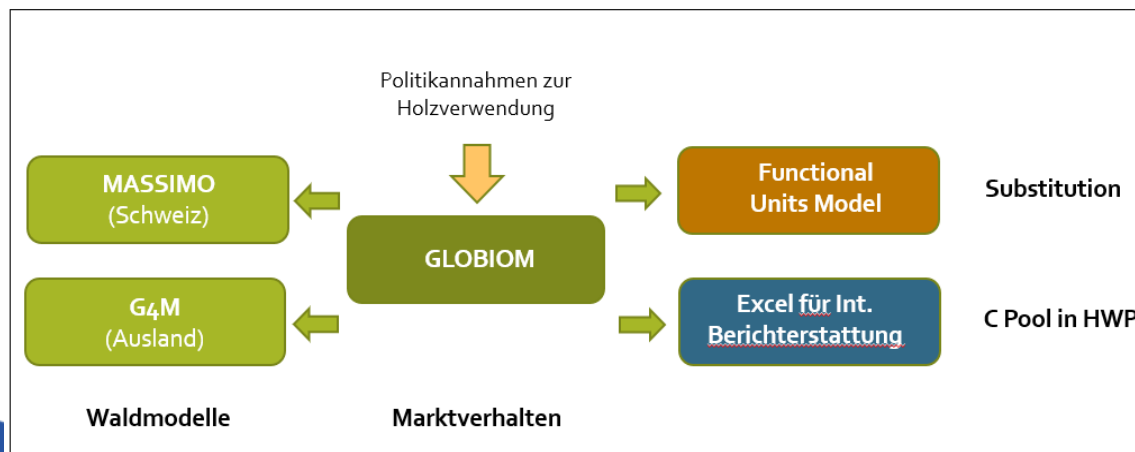
## Scenarios focusing on forest management



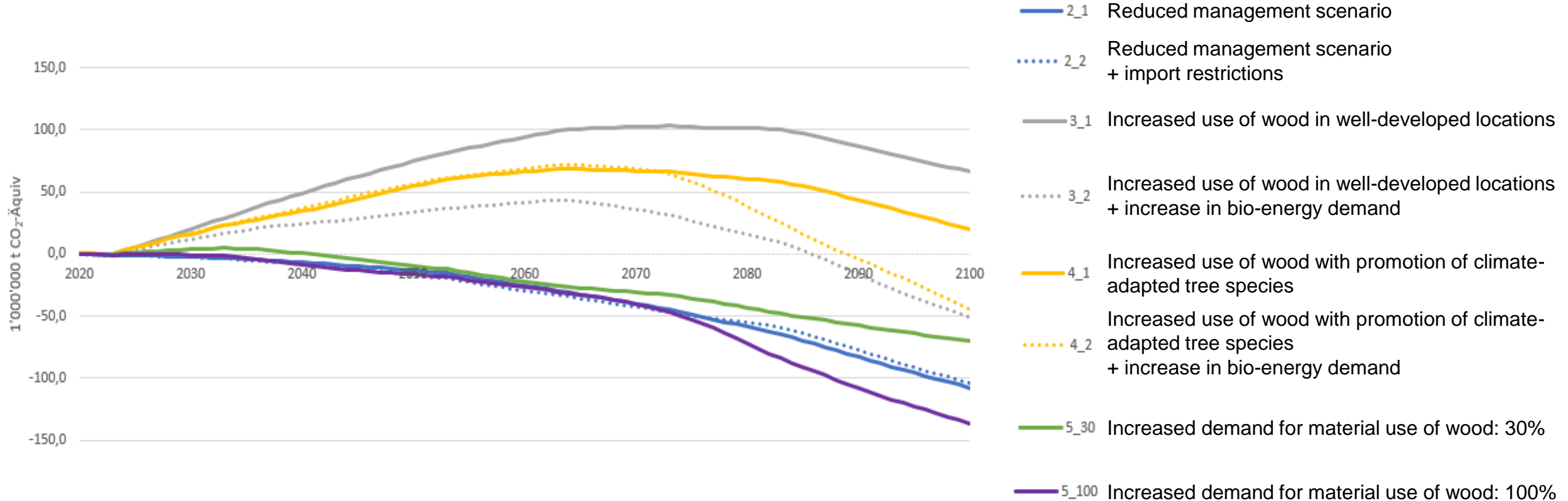
## Scenarios focusing on HWP production



## Scenarios focusing on international trade

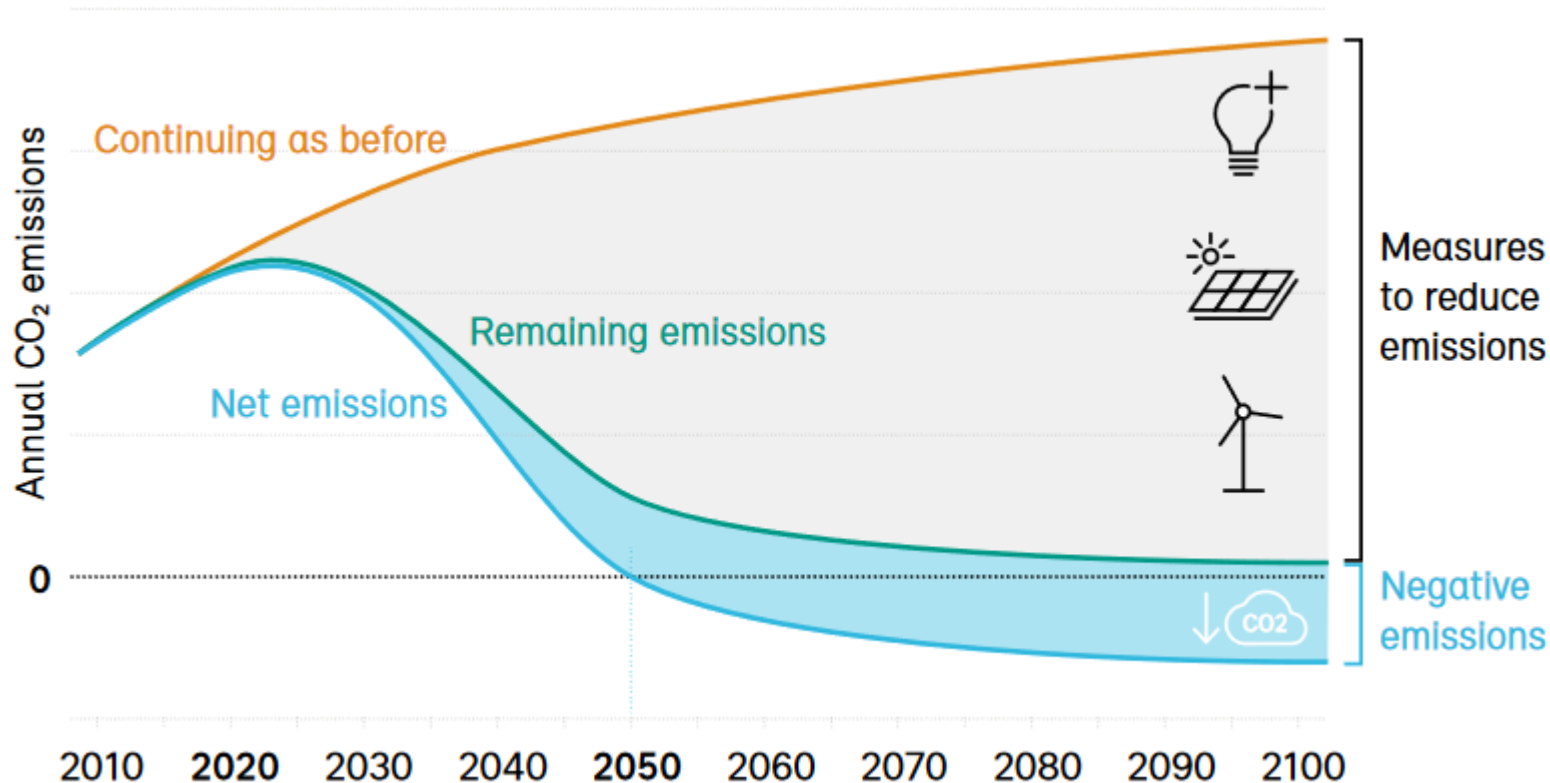


# Assessed carbon effects



Cumulative climate effects as compared to Reference scenario  
100% substitution by 2050

# National long-term climate targets

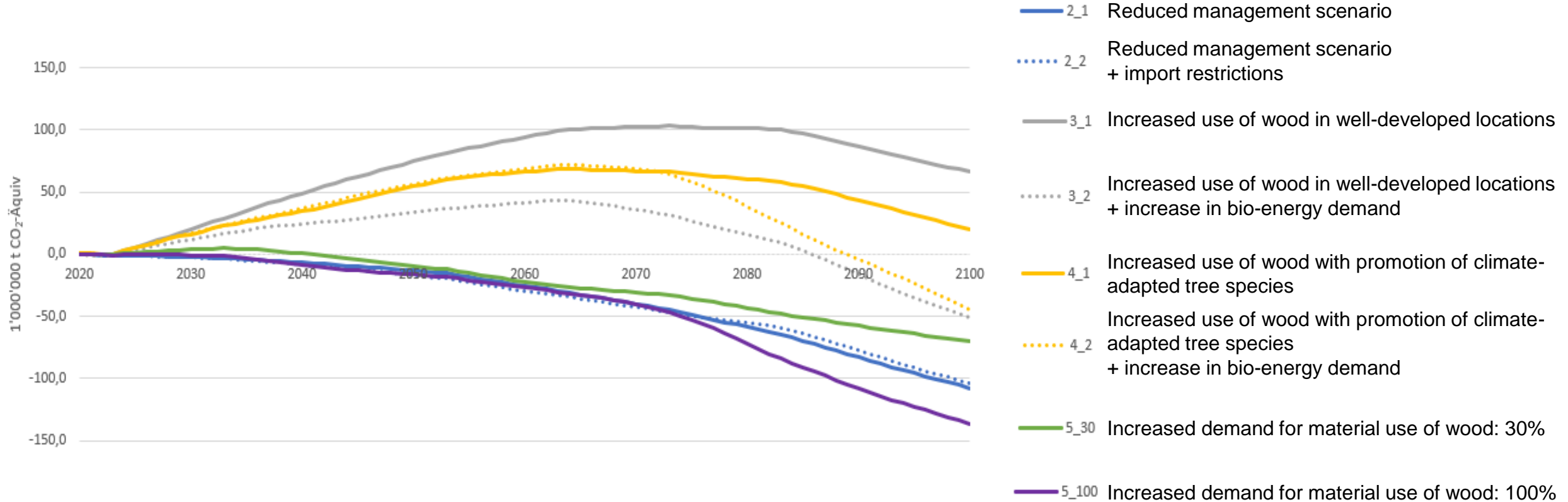


- ▶ National commitment to become climate neutral by 2050
- ▶ Current long-term climate strategy to reduce GHG emissions by 2050 to around 90% of the 1990 level.
- ▶ Remaining emissions must be balanced with negative emissions technologies.

Source: Factsheet Long-term climate strategy

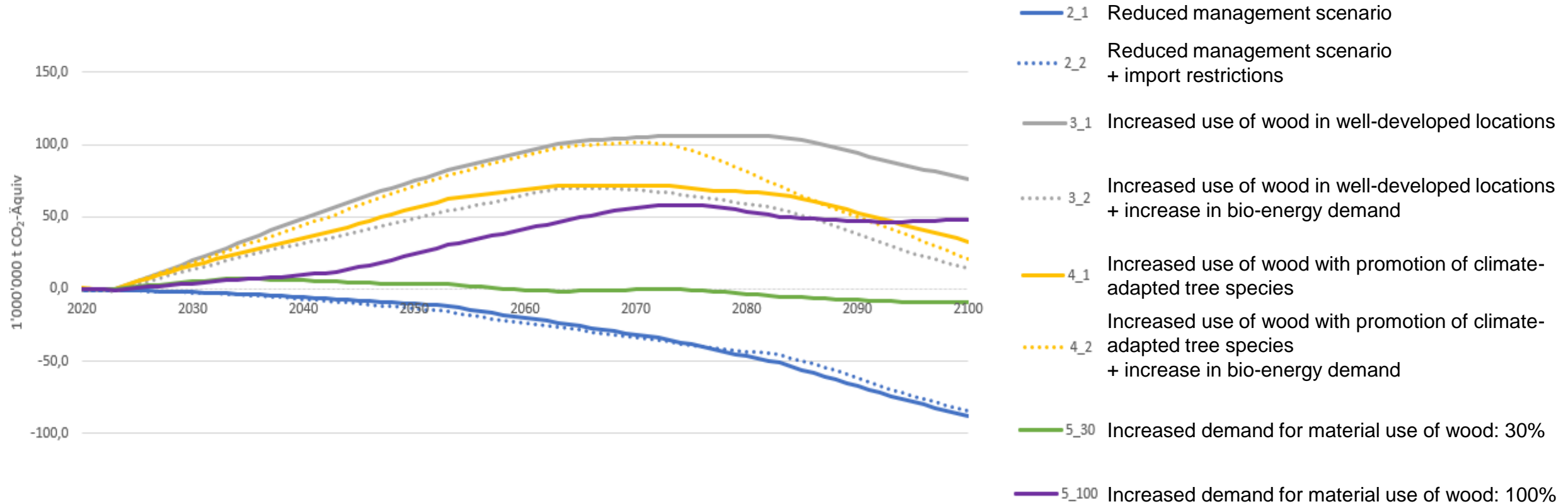


# Assessed carbon effects



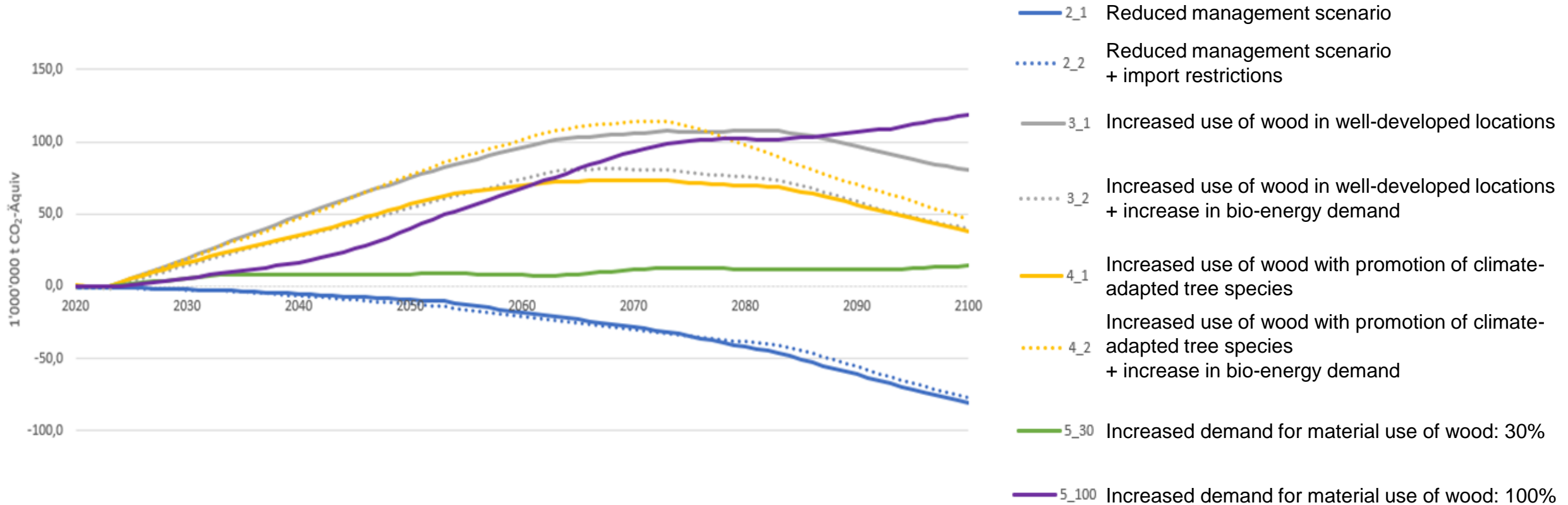
Cumulative climate effects as compared to Reference scenario  
**100% substitution by 2050**

# Assessed carbon effects



Cumulative climate effects as compared to Reference scenario  
**35% substitution by 2050**

# Assessed carbon effects



Cumulative climate effects as compared to Reference scenario  
**10% substitution by 2050**

# Conclusions and final comments

- ▶ Impact of national climate targets were assessed in a very stylized manner but shows the large potential impact and key findings.
- ▶ Accounted for climate change impacts on forest growth but not changes in natural disturbances.

# Thanks for your attention

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