

# Scenarios for selected bio-based materials

Fabian Schipfer,  
Lukas Kranzl

World Sustainable Energy Days  
26. Februar 2015, Wels

# Substitution candidates identified

Materials that are or could be based on either

- fossil feedstocks or
- biomass:

Construction  
materials

Waxes

Polymers

Lubricants

Surfactants

Pharmaceuticals

Asphalt

Ammonia

Insulation  
materials

Solvents

# Substitution candidates selected

Materials that are or could be based on either

- fossil feedstocks or
- biomass:

Construction  
materials

Waxes

Polymers

Lubricants

Surfactants

Pharmaceuticals

Asphalt

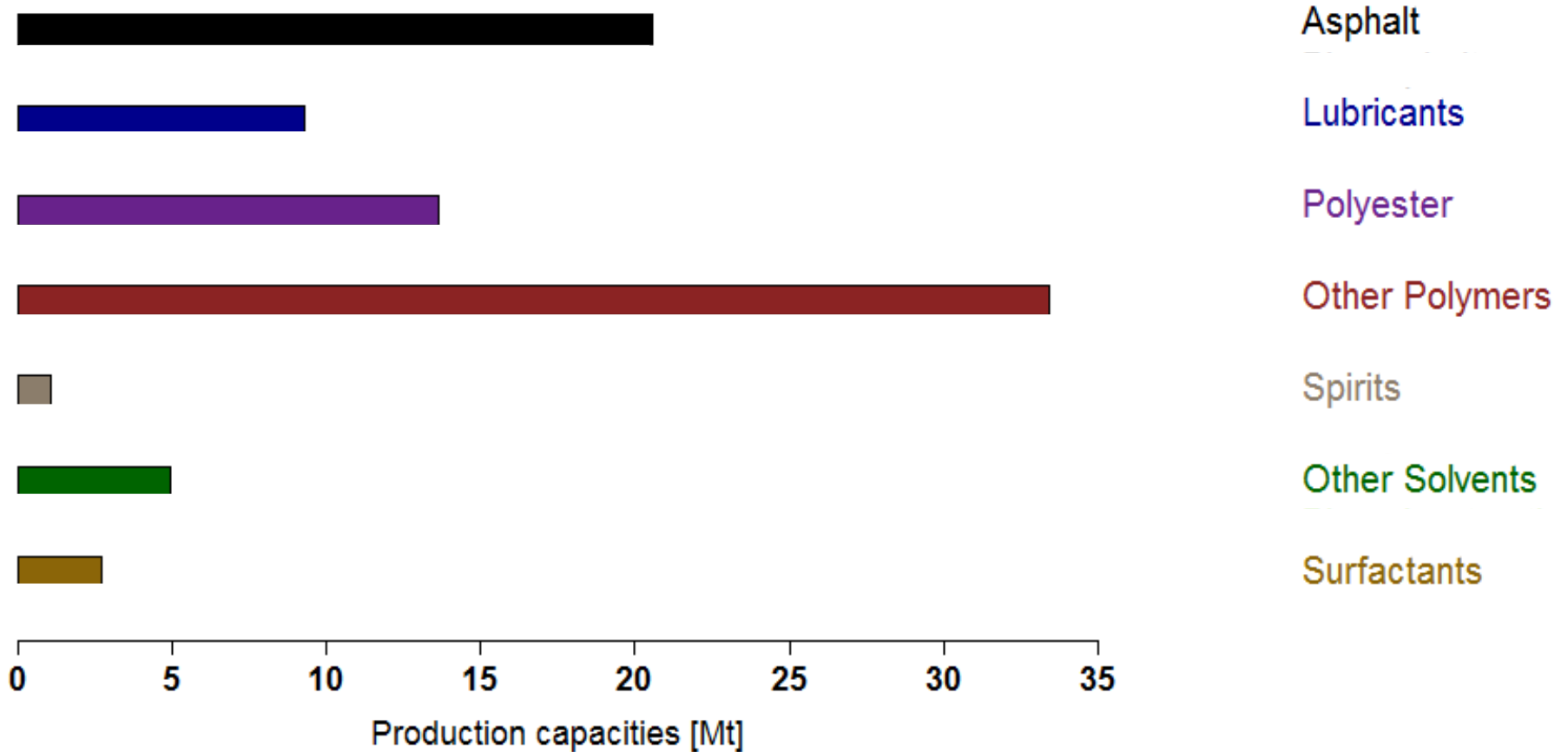
Ammonia

Insulation  
materials

Solvents

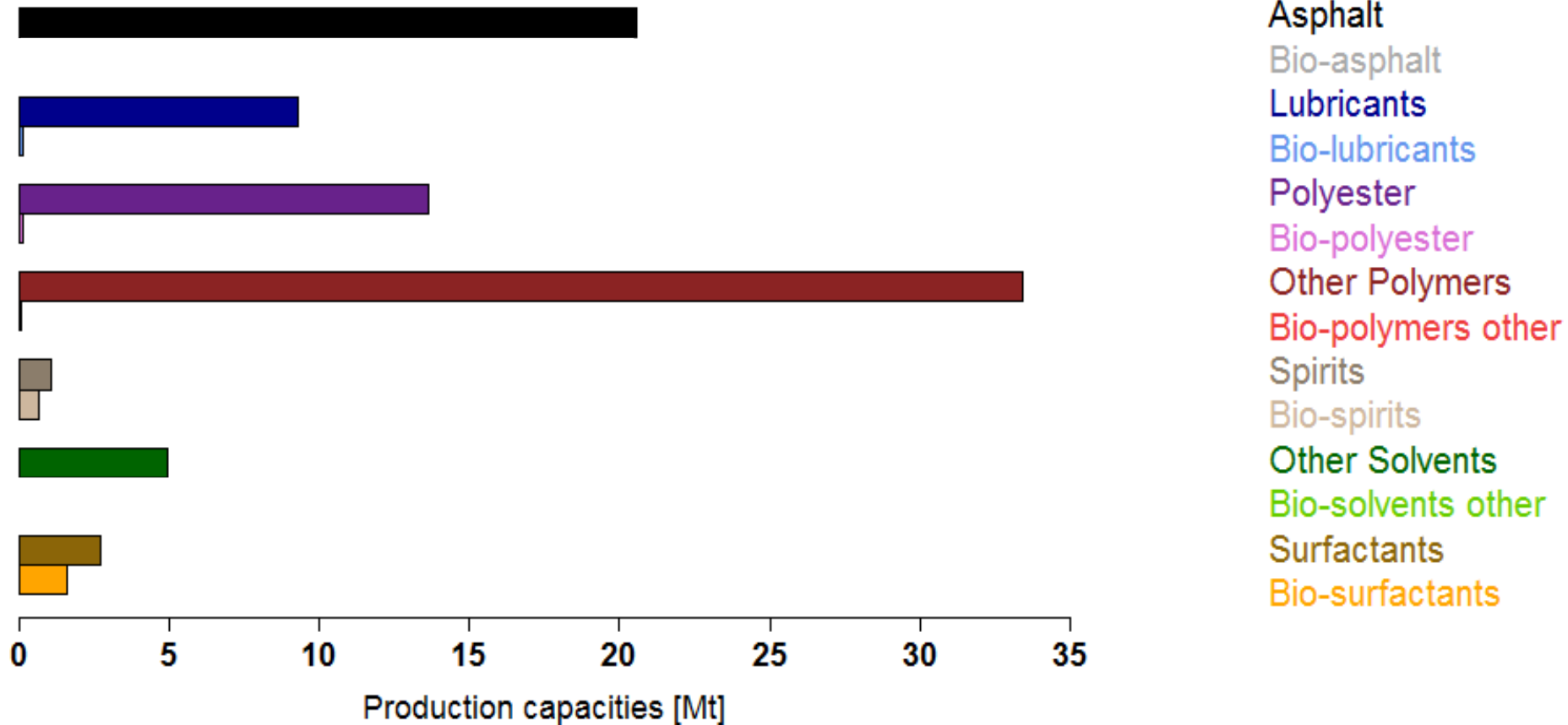
# Selected substitution pairs fossil based counterpart

## 2010 EU28 products



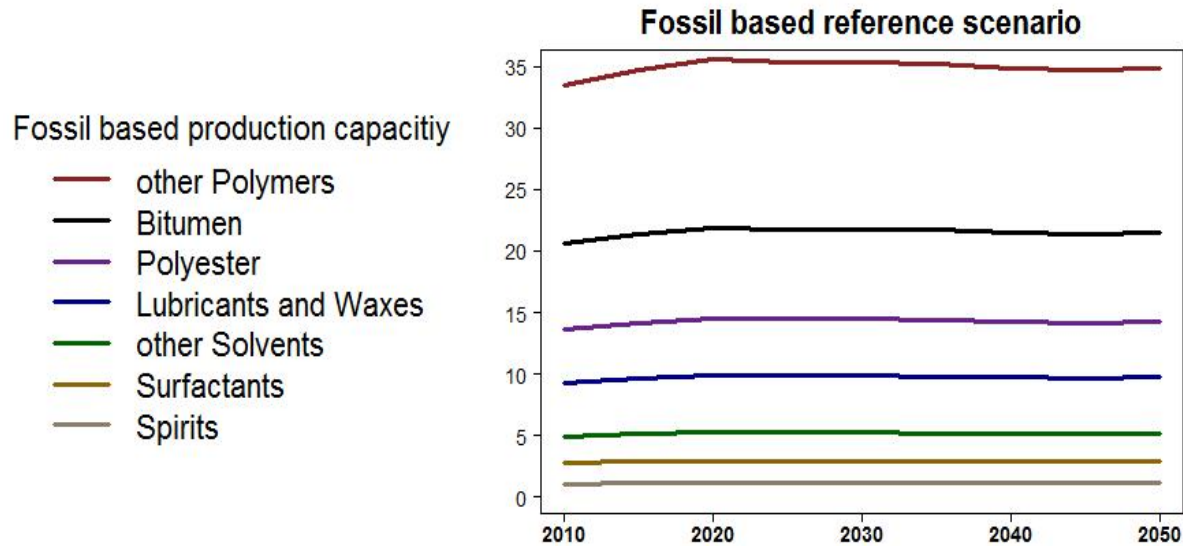
# Selected substitution pairs fossil and biobased based capacities

## 2010 EU28 products and co-products



# Scenario development

## non-energy use of fossil feedstocks in EU28



Source used: PRIMES Reference scenario 2013 (Capros et al, 2013)

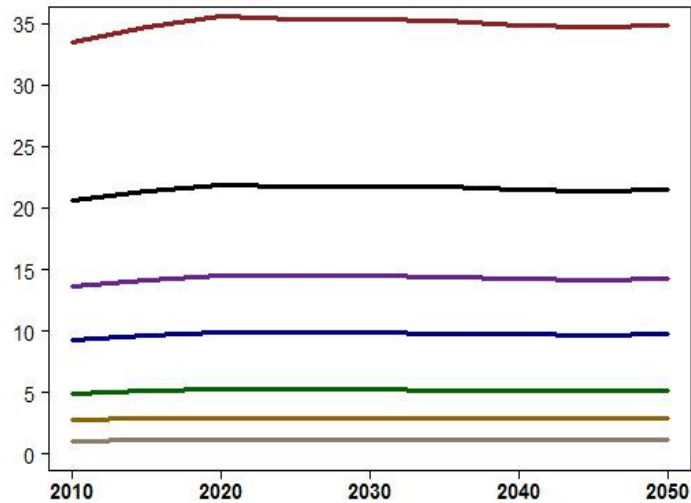
# Scenario development

## assumed biomass based substitution shares

Fossil based reference scenario

Fossil based production capacity

- other Polymers
- Bitumen
- Polyester
- Lubricants and Waxes
- other Solvents
- Surfactants
- Spirits



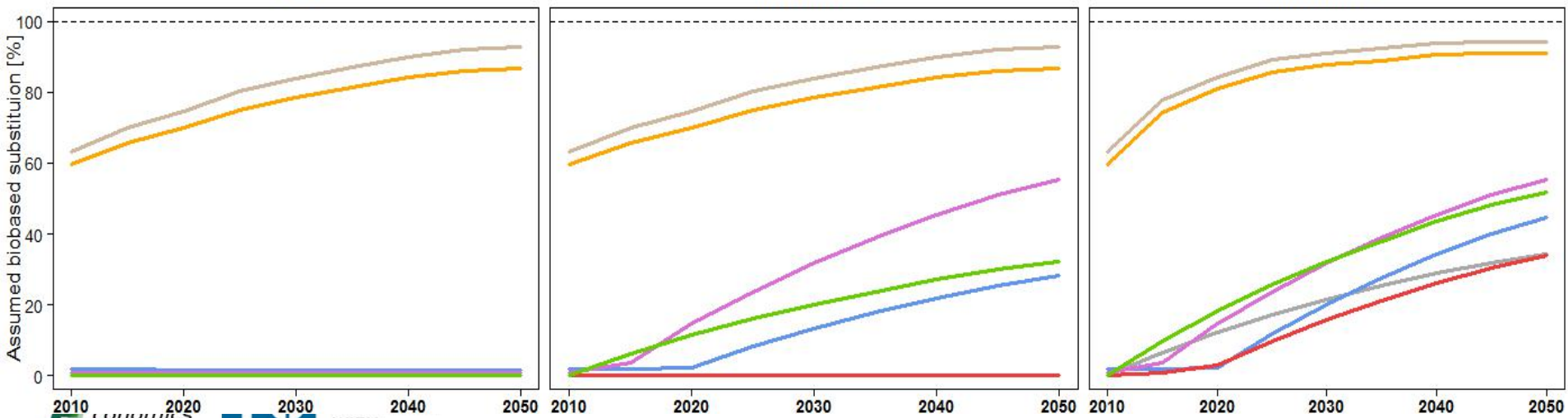
Assumed market substitution

- Bio-spirits
- Bio-surfactants
- Bio-solvents other
- Bio-Polyester
- Bio-Lubricants
- Bio-Polymers other
- Bio-asphalt

Low

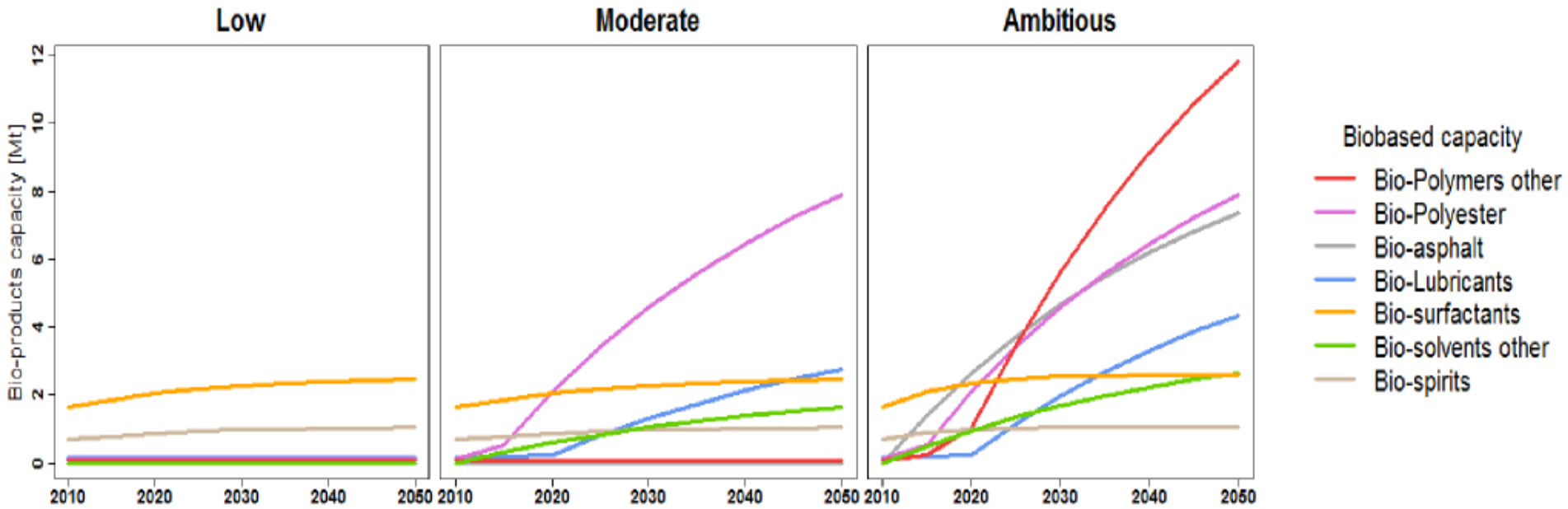
Moderate

Ambitious



# Biobased economy scenarios

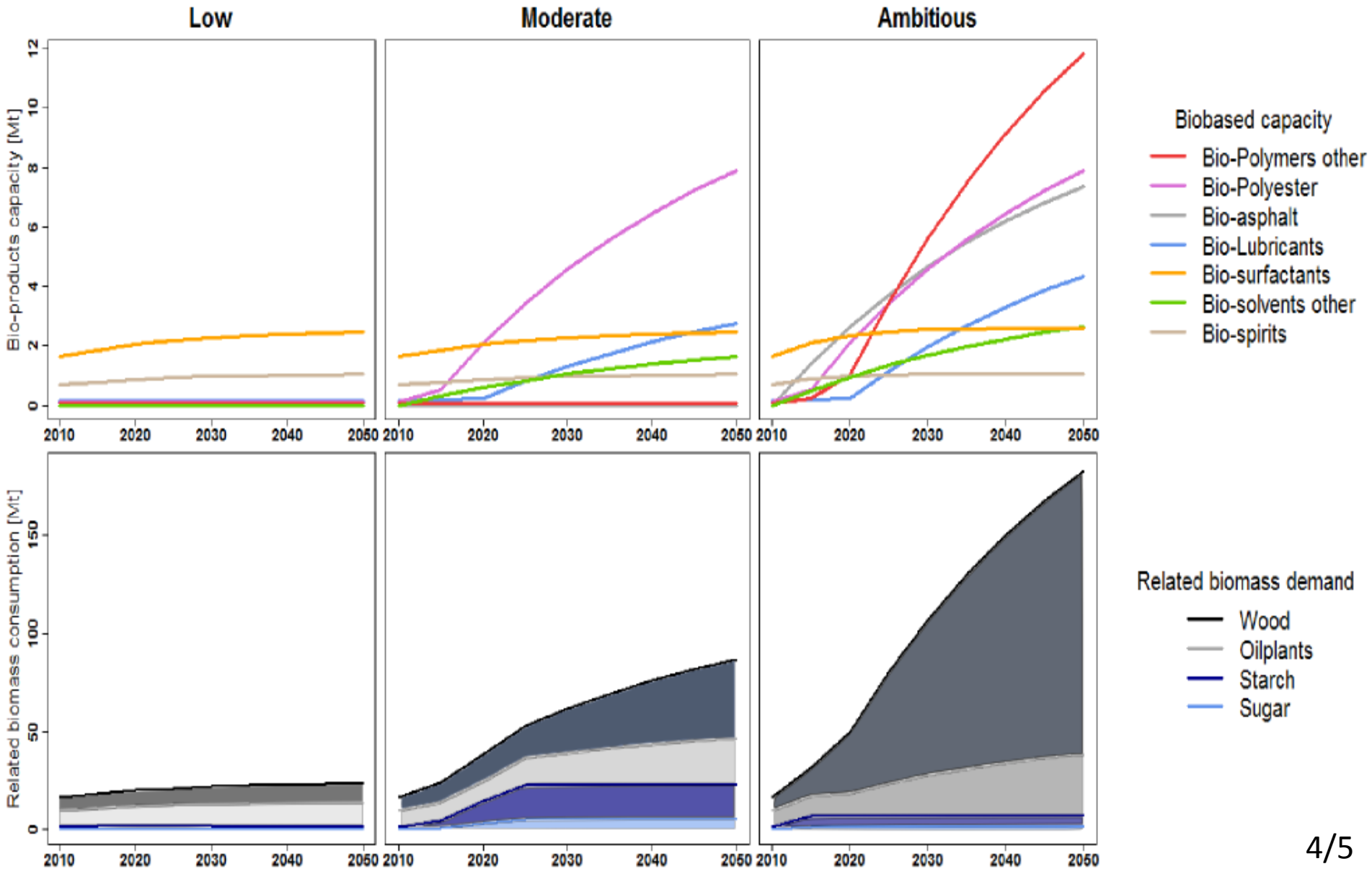
## bio-materials production capacities





# Biobased economy scenarios

## bio-materials production capacities and related demand



# Conclusions

## from the scenario development

### Magnitudes according to the scenario range

- Wood: 10-130 Mt for innovative materials  
300 Mt traditional use / 250 Mt solid biofuels
- Crops: 20-30 Mt for material use  
35 Mt biofuel use

### GHG-mitigation potentials (qualitative)

- Material utilisation enables multi-substitution through recycling/cascaded use
- Carbon capture in bio-asphalt?

### Residual streams/ waste streams

- Valorisation

Vielen Dank für eure Aufmerksamkeit  
*Thank you for your attention*

Energy Economics Group  
Vienna University of Technology  
[www.eeg.tuwien.ac.at](http://www.eeg.tuwien.ac.at)

**Fabian Schipfer**

+43 (0) 1 58801 370363  
[schipfer@eeg.tuwien.ac.at](mailto:schipfer@eeg.tuwien.ac.at)



TECHNISCHE  
UNIVERSITÄT  
WIEN  
Vienna University of Technology