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Competition for wood - bioenergy as game changer in the biomass business?

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Alumni Summerschool 2014

Main competition for biomass is for industrial wood, sawmilling residues and recycled wood

	Pulp& Paper	Board industry	Saw mills	CHP plants 5-20 MW_{el}	CHP plants <5 MW_{el}	Individual burners (boilers)
Stem wood			●			
Industrial wood	◕	◕		◔	◔	◕
Forest residues		◔		◑	◕	◕
Sawmill residues	◕	◕	◔	○	◔	◔
Recycled wood A1		◕		◔	◔	
Recycled wood A2-A4		◔		◕		
Landscape material				◔	◑	○

○ rare consumption ◔ occasional consumption ◑ frequent consumption ◕ dominating consumption ● nearly only consumption

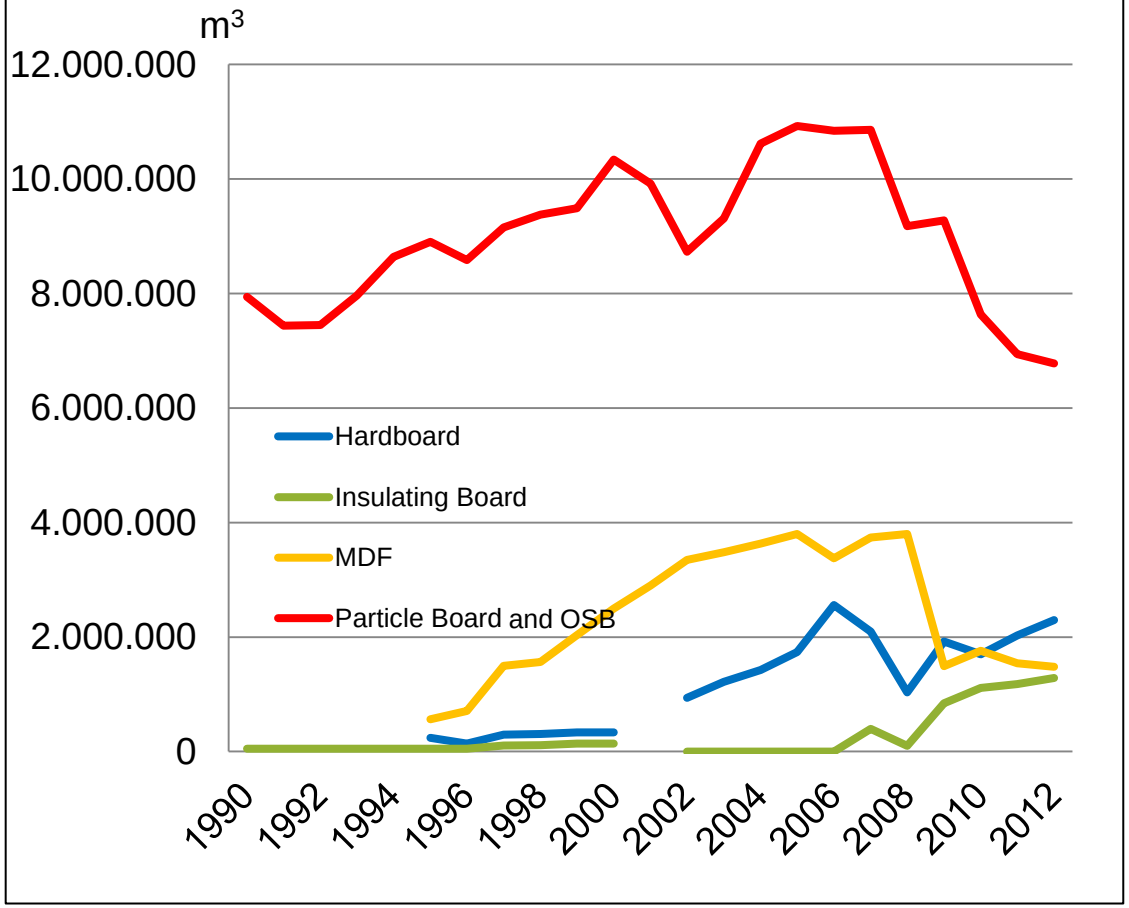
Source: Brenner (2012)

Recently, board production declined – after a very strong increase of production in the past

Total consumption for board production 2010: ca. 16,9 Mio. m³

- Total board production in 2012: ca. 12,1 Mio. m³
- Board production increased strongly after 2000
- After 2008, board production in Germany declined strongly
- One reason: high prices for raw material due to competition with bioenergy
- As a consequence, several production sites were shut down in the last years

Development of board production in Germany



Source: FAO (2014)

Bioenergy as game changer in the biomass business?

Leading questions:

How will the competition for wood between board industry and bioenergy business develop in Germany?

1. Does it make sense, to use industrial wood for bioenergy?

2. How will the main consumers of wood for bioenergy develop?

Kronotex, Heiligengrabe

RWE Group, Berlin

From a forest owners' point of view, the utilisation of industrial wood for bioenergy doesn't make sense

- Assuming a wood chip price of 25 €/m³, it doesn't make sense to use industrial wood for bioenergy
- Prices for wood chips would have to raise up to 55 €/m³, before break even point with industrial wood is reached

→ Lack of communication/correct calculation regarding profitability of supply of wood chips for bioenergy from industrial wood

Net profit/ha (fully mechanized harvesting system)

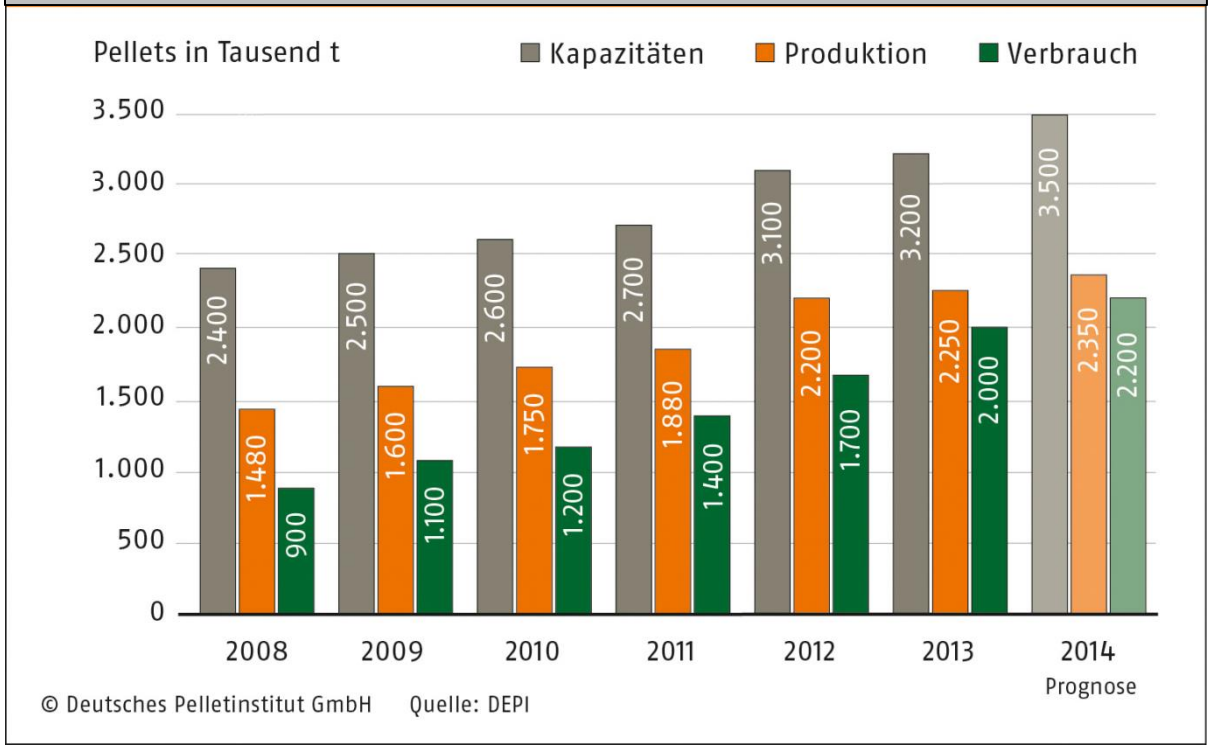
Source: Cremer (2008)

There won't be a high increase in domestic wood pellet production in Germany

Total consumption for pellet production today: 3,27 Mio. m³

- Production capacity already today considerably higher compared to actual production
- Capacity will be enough to supply growing demand as well
- Consolidation of market is expected, large new production facilities in Germany unlikely

Pelletproduction and demand in Germany



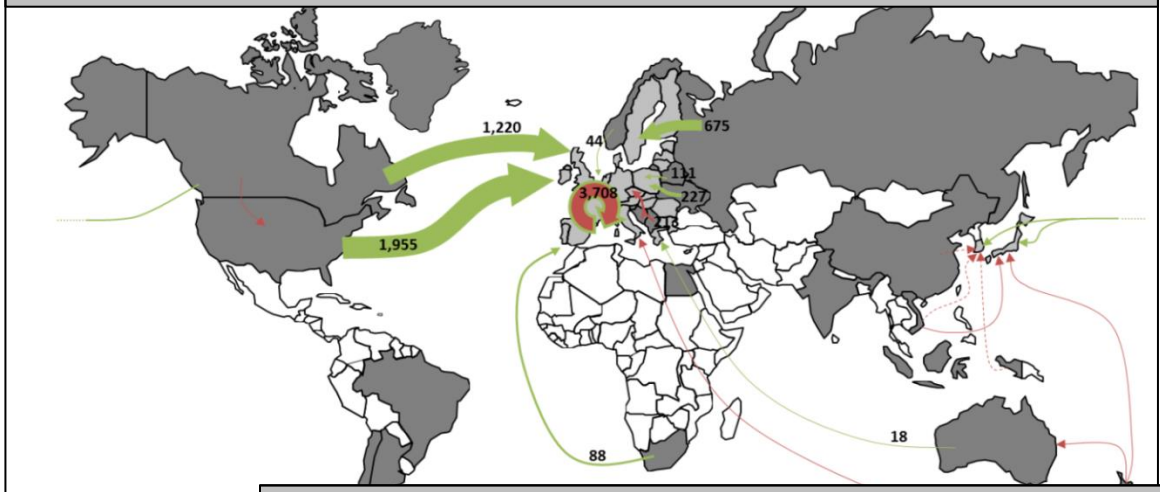
Source: DEPI (2014)

Additional demand for industrial pellets for large power plants (1-50+ MW) will be met by increased imports

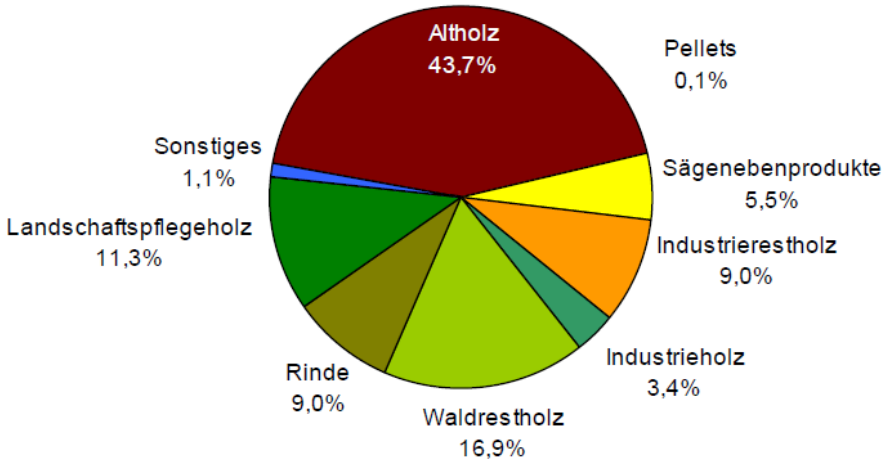
Total consumption for large scale energy production 2010: 22,6 Mio. m³ (ca. 14 Mio. t/a)

- Additional demand for industrial pellets will be met by increased imports to Europe
- Additional biomass demand is expected to be low, as new EEG requirements are difficult to fulfil

Global wood pellet trade flows 2012



Assortments used in German biomass power plants

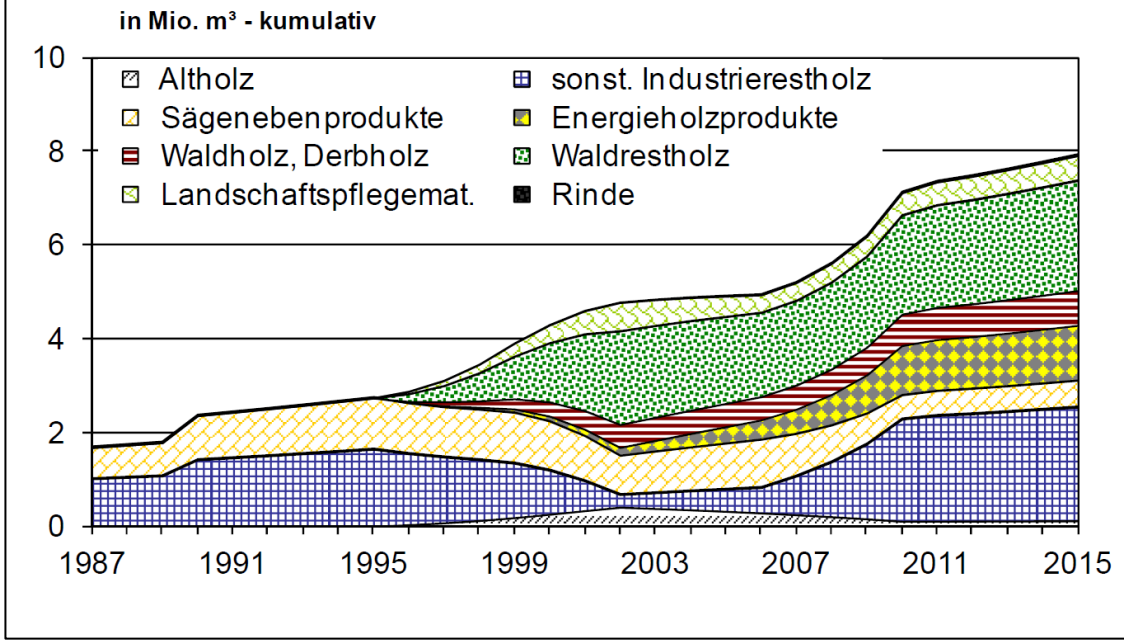


Additional demand wood chips will mainly come from community-owned, small sized heating plants

Total consumption for small scale energy production 2010: 7,5 Mio. m³ (ca. 5,3 Mio. t/a)

- Moderate increase of (high quality!) wood chip demand can be expected from small sized heating plants (0,015-1 MW)
- Full potential is not yet utilized; often high paying capability due to strong local embedding

Development of assortments used in biomass plants < 1MW



- Main difference to wood industry: completely different structure, very many, and – in comparison to wood industry – very small scale customers

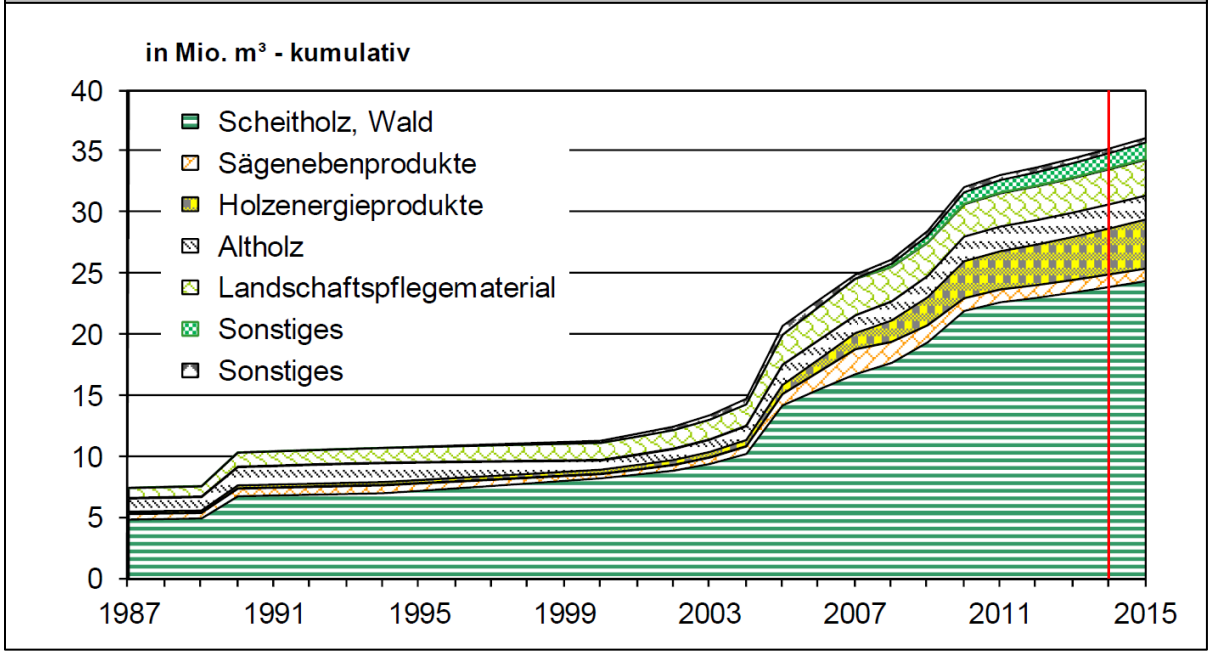
Source: Mantau (2012); Weimar et al. (2012)

Utilisation of firewood in private households is on a very high level but will only slightly increase in the future

Total consumption of firewood 2010: 23 Mio. m³

- Consumption of fire-wood in private house-holds increased strongly in the last years
- Only slight increase expected in the future
- Main difference to industrial wood consumers: consumers of firewood are only little price sensitive → most important competitor for wood industry

Expected consumption of firewood in private households

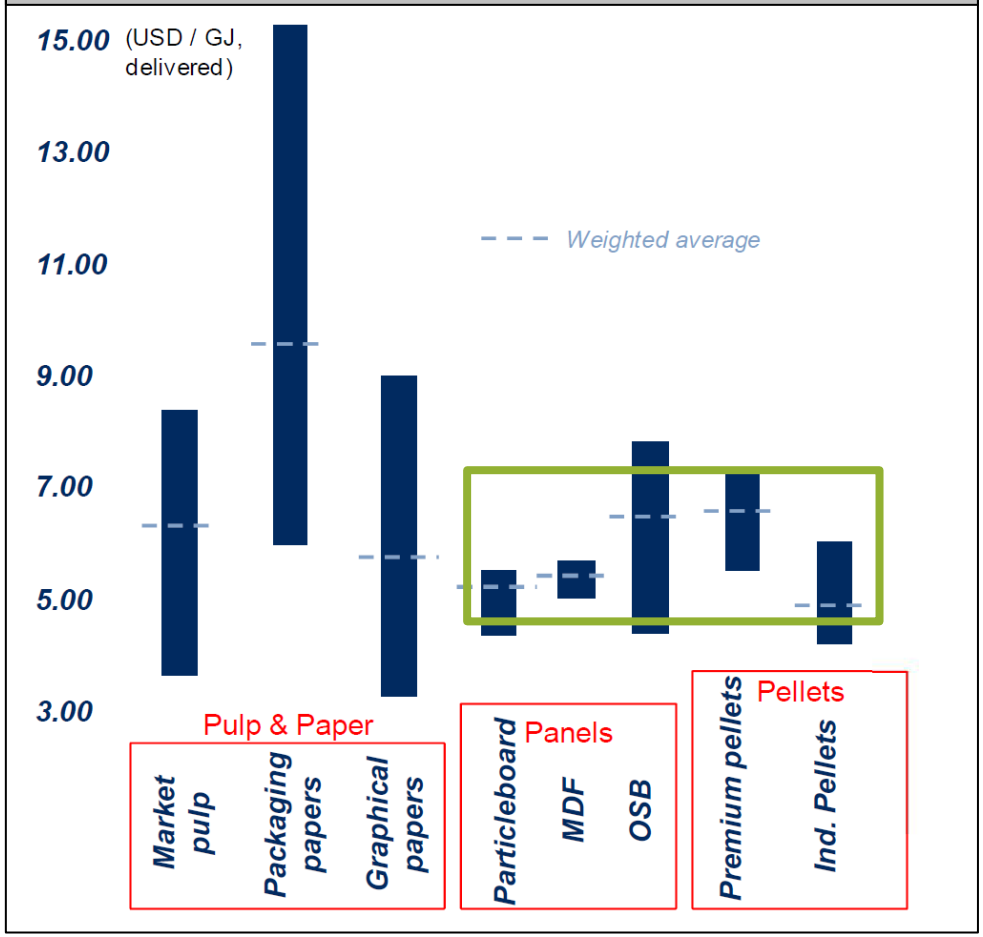


Source: Mantau (2012)

Paying capability of pellet industry is less than expected → competition will only slightly increase

- Wood paying capability of pellet industry is in the range of other industries
- Especially pulp and paper industry can pay considerably more for their raw material

Wood paying capability range by industry



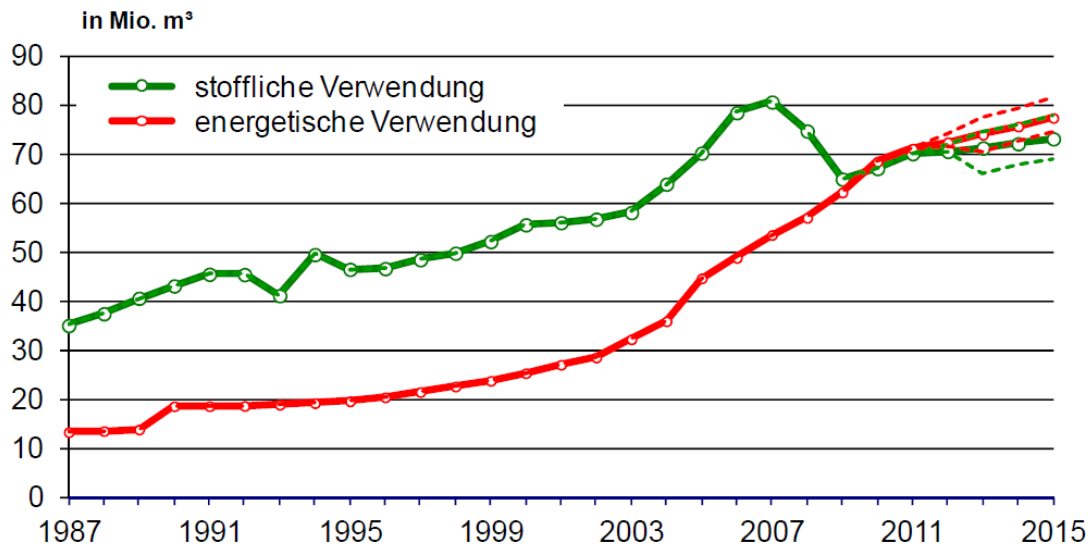
Source: Pöyry (2012)

Competition for biomass as described has increased in the past, but will slow down in the future

→ Main problems of board industry are not only new competitors

- Other problems are:
  - Economic crisis
  - Overcapacities in the market
  - Saw mills use saw dust on their own (horizontal integration)
  - New products replacing wood

Development of material and energetic utilisation of biomass in Germany



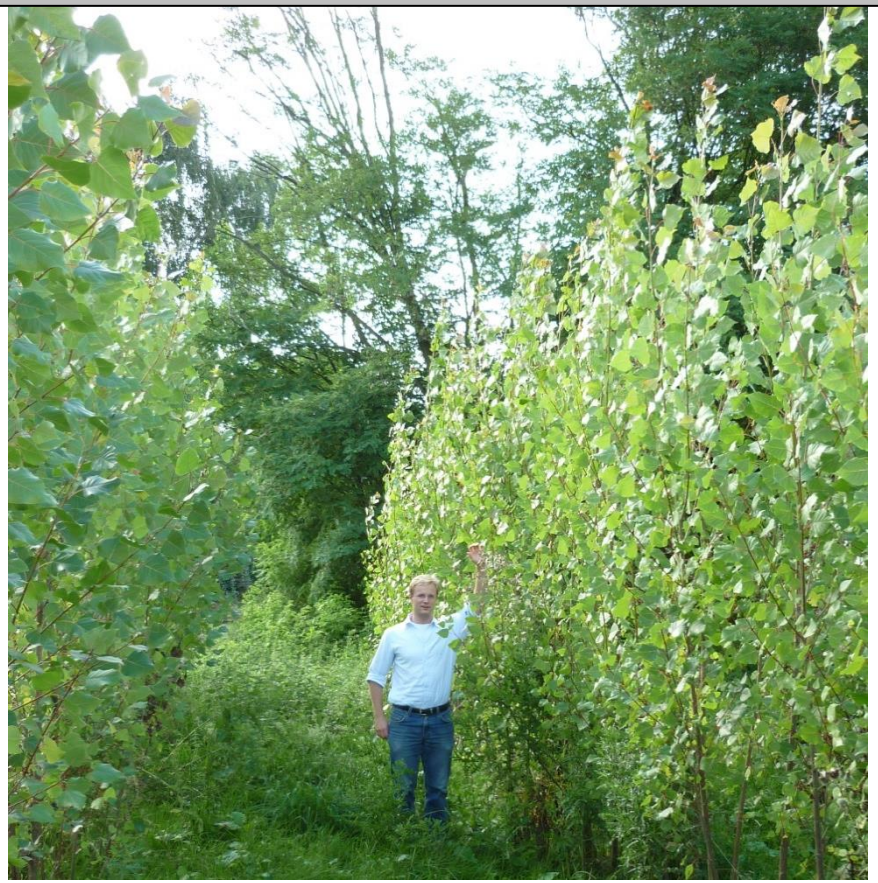
→ Competition for biomass as described has increased in the past, but will slow down in the future

Source: Mantau (2010); Kibat (2011)

Still, new approaches can help to decrease the existing competition

- SRC with only little effect and with focus on regional concepts (→ R&D to deliver high quality chips)
- Enhance data collection to get a solid base regarding standing and harvested biomass volumes etc.
- Increase biomass potentials by implementing new silvicultural concepts (focus not only on hardwood but also on highly productive softwood!)
- Decrease standing volumes for 10-15 years (Bioenergy as bridge)
- No additional restrictions on utilization of forests

Short Rotation Coppice in Dortmund, Germany



Source: Cremer (2011)

These approaches can help to create a proper framework for both users of forest biomass

- Develop concepts, technologies and products to increase attractiveness of hardwood utilisation (Increasing hardwood volumes e.g. in Brandenburg)
- Utilization of „new“ materials in board industry (hemp, straw,...)
- Development of concepts on how to utilise biomass in an optimal way (politics, wood-/energy industry)
- Foster public discussion on utilisation of forests

Innovative utilisation of hardwood

Thermo wood

Glue laminated timber

Source: LWF (2010), www.thermoholz-deutschland.de

Not bioenergy is a game changer, but an upcoming bio-based economy; this has to be actively managed

HNE Eberswalde
Hochschule für nachhaltige Entwicklung (FH)
Eberswalde University for Sustainable Development
University of Applied Sciences

high

Creating value

low

Product	Status Quo
Biomaterials, e.g. - Polymers - Composites - Viscose	No significant consumption today; increase in the future possible
Biochemicals, e.g. - Flavours, Proteins - Fine chemicals	No significant consumption today; increase in the future possible
Biofuels, e.g. - Bioethanol - Biodiesel	**Bioethanol:** 1st generation biofuel production in place; further expansion can be seen **Biodiesel:** 2nd generation biofuels in pilot/ demonstration phase; Increasing oil prices will strongly affect the development (e.g. aviation industry)
Pulp and paper	No significant increase in Germany expected
Boards, Furniture	No significant increase in Germany expected
Bioenergy - Electricity/Heat - (Torrefied) pellets	Bioenergy: operations in commercially scale; increase of cofiring will strongly increase pellet demand in Europe

high

Cost / price

low

Source: Pöyry (2012)

Thanks a lot for your kind attention!

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