



Udo Mantau:

Forest-based raw material resources?



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  - get the total picture of a resource market
2. Methodological comments
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3. EUwood – development of woody biomass
  - how much can we use?
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## Forest based raw material resources

What is considered forest based and what not?

How much wood we can use depends on the way we are using all woody biomass. It may be forest based but the way it is used or treated depends simply on the owner and his markets.

**"It's the economy, stupid."**





## Wood resource balance - the complete view on resources?

### Targets of the EUwood project

1. Transparency for the markets of wood resources for Europe (EU27) and the individual countries. Thereby quantify and explain the new areas of energy use and other woody biomass resources.
2. Develop scenarios for each of the sectors 2010 to 2030 along given specifications. In this context make a „gap projection“ for the expected surplus or deficit of woody biomass in Europe.



# Wood resource balance - How big is the resource?

## 1 Dimensions

Europe (EU27) 2010 – sector dimensions (medium mobil. - A1)

### Dimensions of the wood resource market 2010

→ Resource potential

Potential demand ←

**717 M m<sup>3</sup>**  
**331 M odt**  
**5.973 PJ**



**458 M m<sup>3</sup>**  
**229 M odt**  
**3.994 PJ**

**308 M m<sup>3</sup>**  
**139 M odt**  
**2.499 PJ**



**367 M m<sup>3</sup>**  
**173 M odt**  
**3.017 PJ**

Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; LEEK, N.: Post -consumer wood; OLDENBURGER J.: Landscape care wood; SAAL, U.: Industrial residues; MANTAU/SAAL: Wood industry; PRINS, K.: Policy options; JONSSONS, R. EFSOS calculations)



# Wood resource balance - the complete picture?

## 1 Dimensions

- E27 potential and demand in M m<sup>3</sup> medium mobilisation

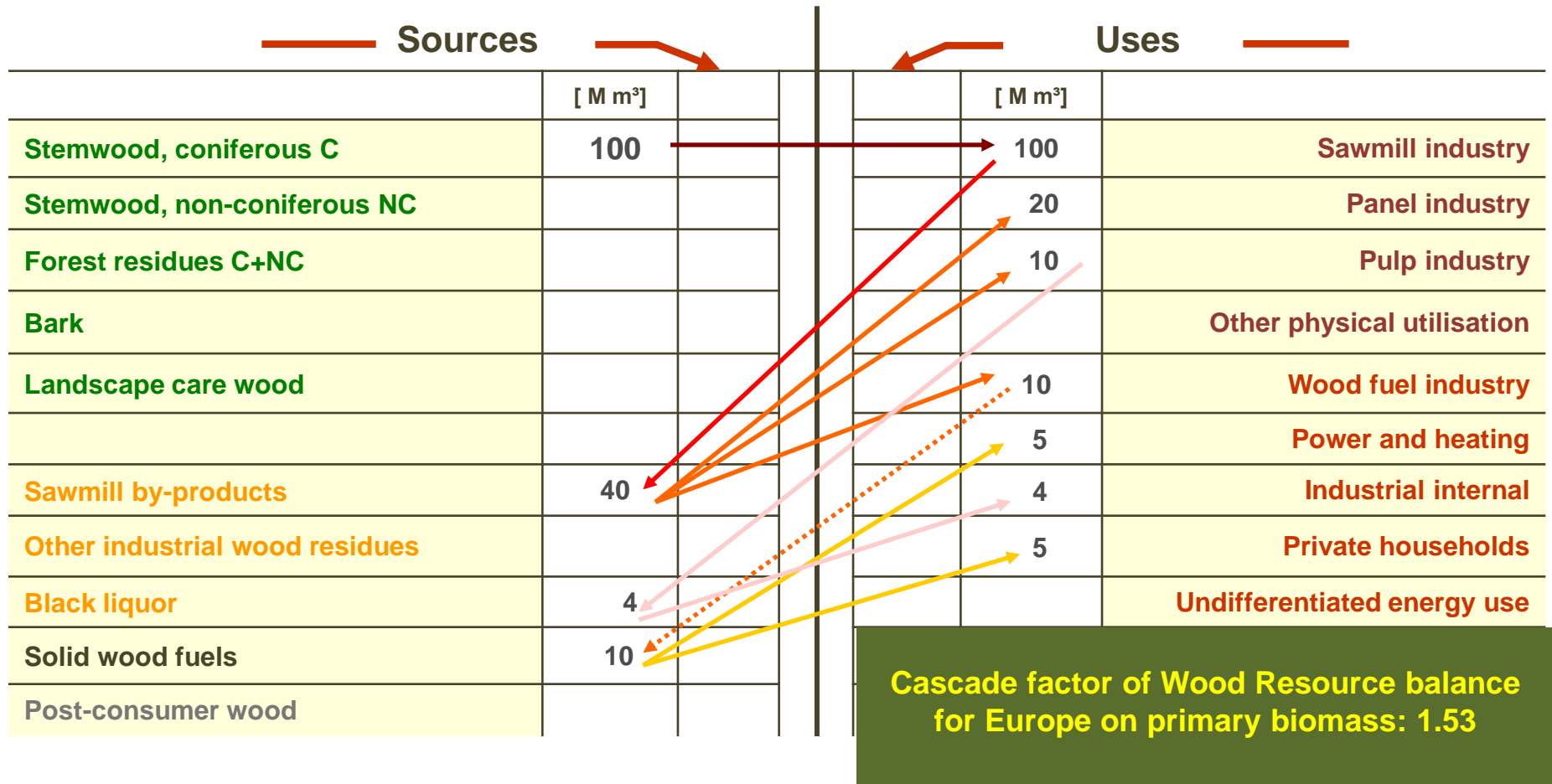
Potential in M m <sup>3</sup>	2010	%	2010	%	Demand in M m <sup>3</sup>
<b>Stemwood C, ME</b>	<b>362</b>	35.3	<b>196</b>	23.8	<b>Sawmill industry</b>
<b>Stemwood NC, ME</b>	<b>182</b>	17.7	<b>11</b>	1.3	<b>Veneer/plywood industry</b>
<b>Forest residues, ME</b>	<b>118</b>	11.5	<b>143</b>	17.3	<b>Pulp industry</b>
<b>Bark, ME</b>	<b>55</b>	5.4	<b>92</b>	11.2	<b>Panel industry</b>
<b>Landscape c.w. (USE) ME</b>	<b>59</b>	5.8	<b>15</b>	1.8	<b>Other material uses</b>
<b>Short rotation plantation</b>	<b>-</b>		<b>21</b>	2.5	<b>Producer of solid wood fuels</b>
<b>Sawmill by-products</b>	<b>87</b>	8.5	<b>86</b>	10.4	<b>Forest sector internal use</b>
<b>Other industrial residues</b>	<b>30</b>	2.9	<b>83</b>	10.1	<b>Biomass power plants</b>
<b>Black liquor</b>	<b>60</b>	5.8	<b>23</b>	2.8	<b>Households (pellets)</b>
<b>Solid wood fuels</b>	<b>21</b>	2.0	<b>155</b>	18.8	<b>Households (other)</b>
<b>Post consumer wood</b>	<b>52</b>	5.1	<b>0</b>	0.0	<b>Liquid biofuels</b>
<b>Total</b>	<b>1.026</b>	100.0	<b>825</b>	100.0	<b>Total</b>

Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; LEEK, N.: Post -consumer wood; OLDENBURGER J.: Landscape care wood; SAAL, U.: Industrial residues; MANTAU/SAAL: Wood industry; PRINS, K.: Policy options; JONSSONS, R. EFSOS calculations)



# Wood resource balance - a total resource assessment methodology

## 2 Methods - Cascade uses and cascade factors



$\Sigma$  total sources in example: 1.54

154

$\Sigma$  total uses



# Euwood - transparent calculations

## 2 Methods - scenarios

→ *source*

*use* ←

[mio. m <sup>3</sup> ]				[mio. m <sup>3</sup> ]
stemwood	<b>EFISCEN</b>		<b>EFSOS Conversion factors and WRB</b>	Sawmill industry
forest residues				Panel industry
bark				Pulp industry
				other material uses
Woody biom. outside for.	<b>Literature &amp; modelling</b>			
post consumer wood				
sawmill by products	<b>EFSOS &amp; conv. factors</b>			Wood based fuel industry
other industrial residues				wood industry internal use
black liquor				biomass power plants
				household use
				liquid biofuels
Processed wood fuel	<b>Energy use</b>			
			<b>EU RES 2020 calc. enquiries</b>	

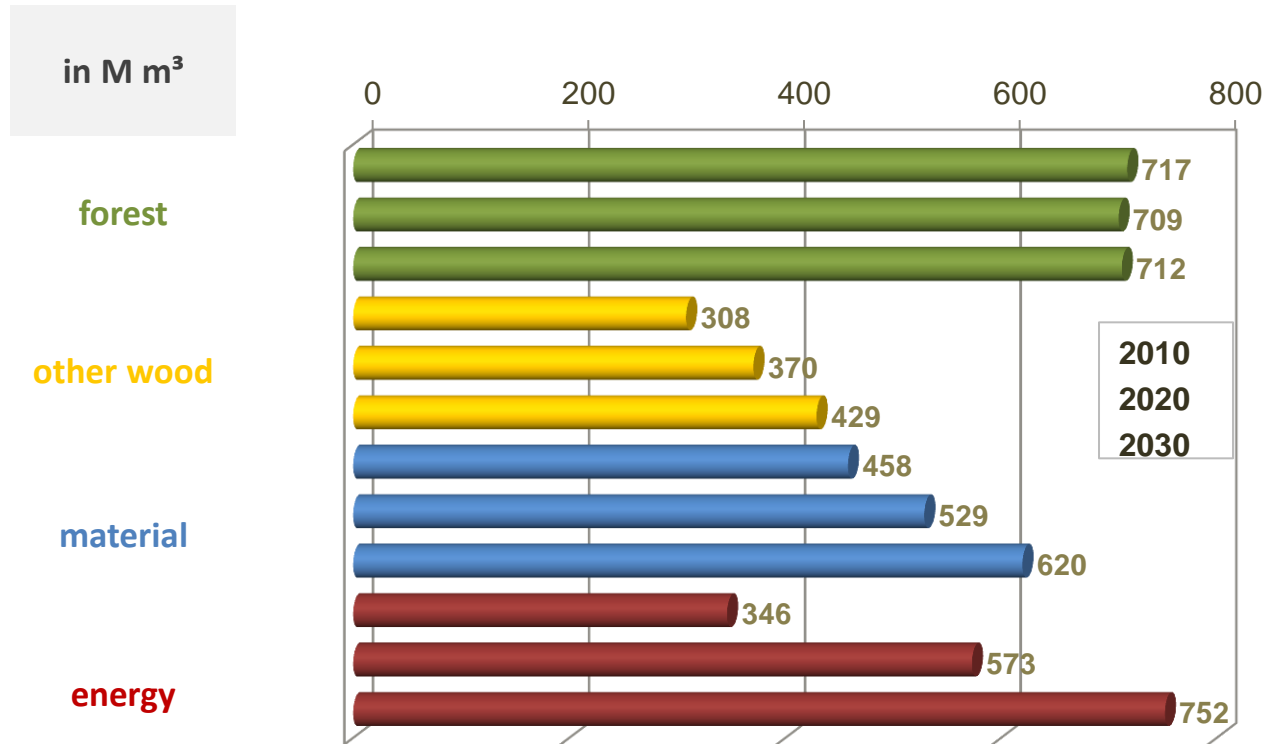
Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; LEEK, N.: Post -consumer wood; OLDENBURGER J.: Landscape care wood; SAAL, U.: Industrial residues; MANTAU/SAAL: Wood industry; PRINS, K.: Policy options; JONSSONS, R. EFSOS calculations)



# Euwood - How much can we use?

## 3 Developments - sectors

- E27 potential and demand in M m<sup>3</sup> medium mobilisation

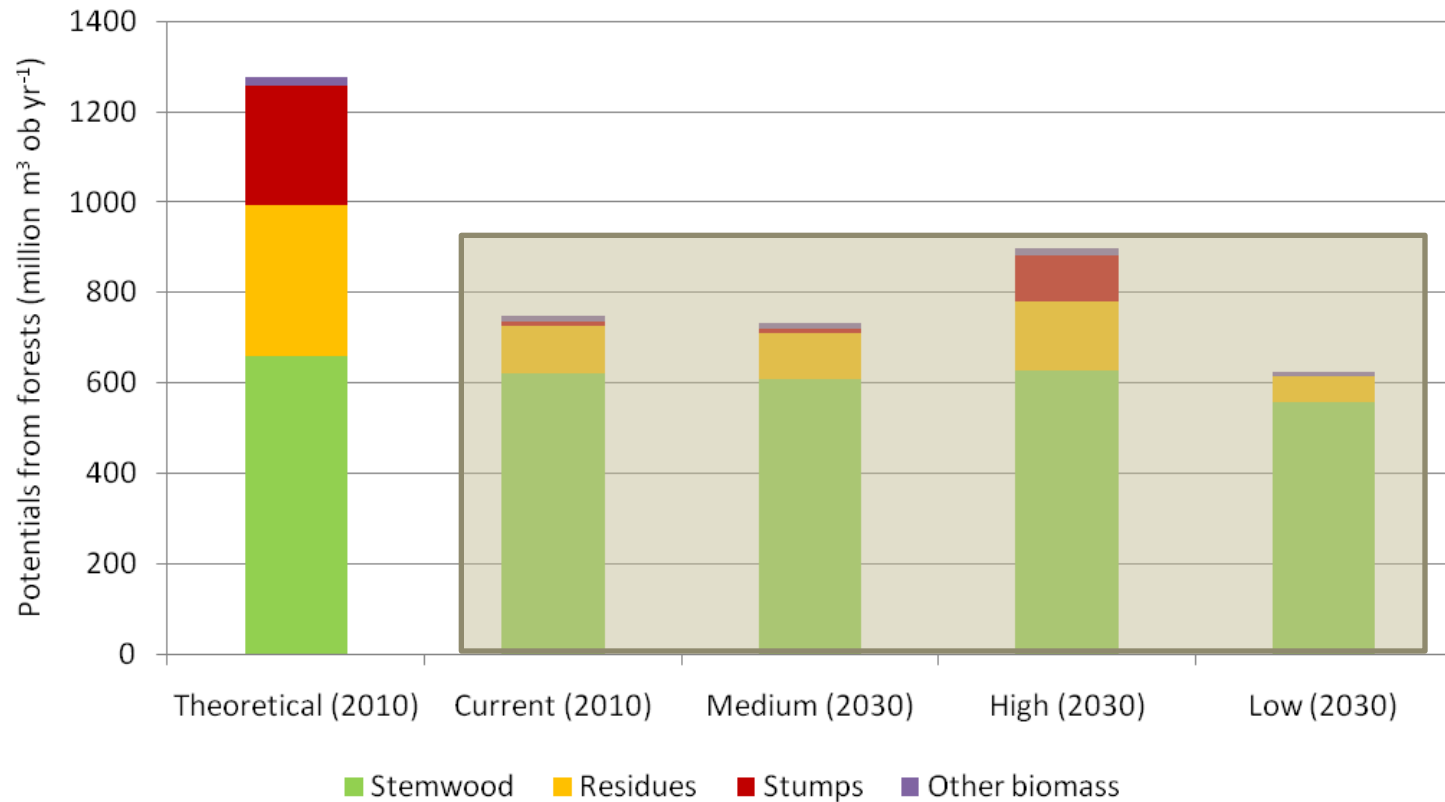


Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; LEEK, N.: Post -consumer wood; OLDENBURGER J.: Landscape care wood; SAAL, U.: Industrial residues; MANTAU/SAAL: Wood industry; PRINS, K.: Policy options; JONSSONS, R. EFSOS calculations)



# EUwood - How much can we use?

## 3 Developments – sensitivity of forestry potential



Source: Verkerk, H.; Lindner, M.; Anttila, P. & Asikainen, A. 2010: The realistic supply of biomass from forests. pp 56-79. in: EUwood - Final report. Hamburg/Germany, June 2010. 160 p.



# EUwood - How much can we use?

## 3. Developments - constraints on biomass supply from forests applied in EUwood

environmental



ownership size



technical



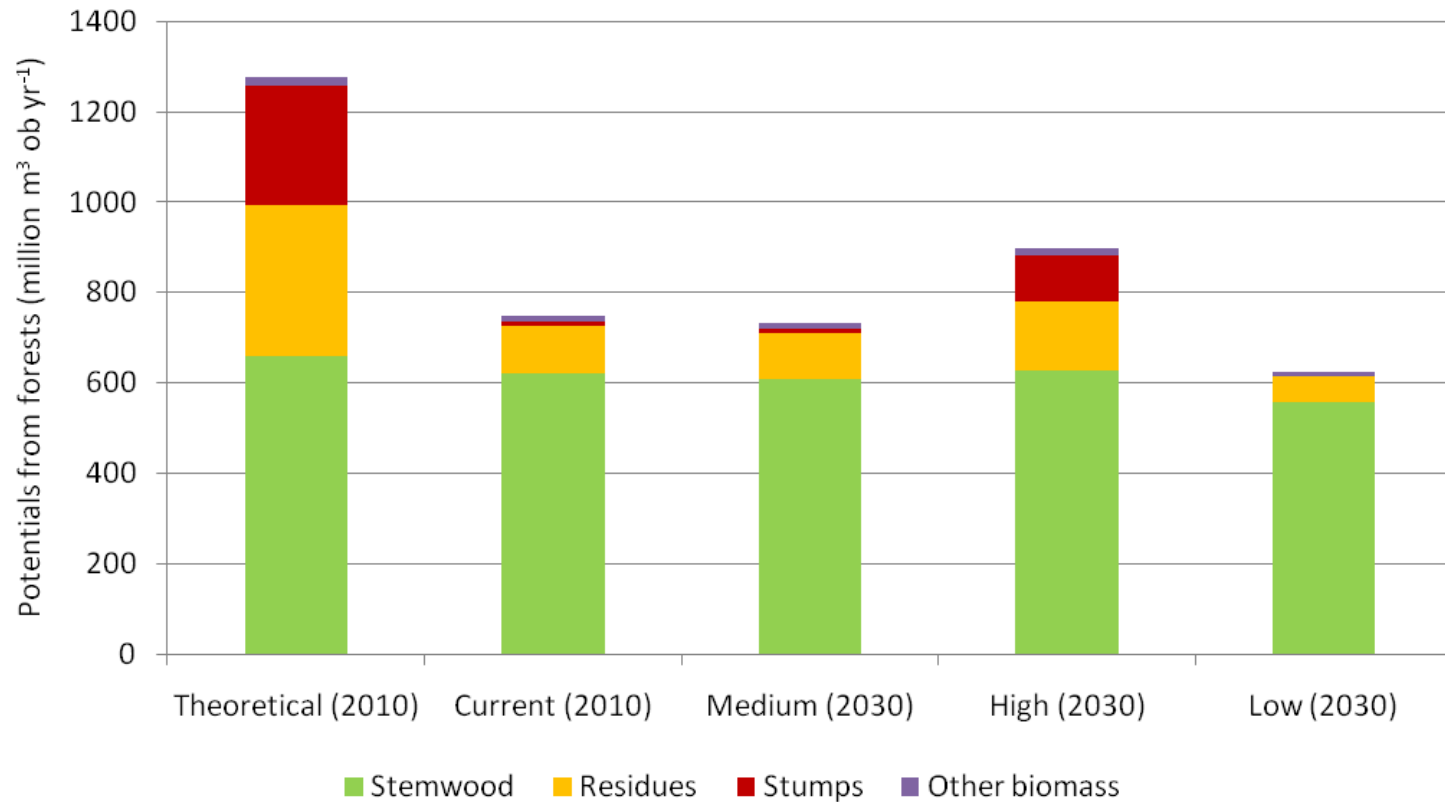
Economic constraints –  
in the sense of:  
How much wood will be mobilized  
in given cost/price relation  
in a specific year  
were NOT calculated.

Source: Photos from Verkerk, H.; EUwood presentation



# EUwood - How much can we use?

## 3 Developments – sensitivity of forestry potential

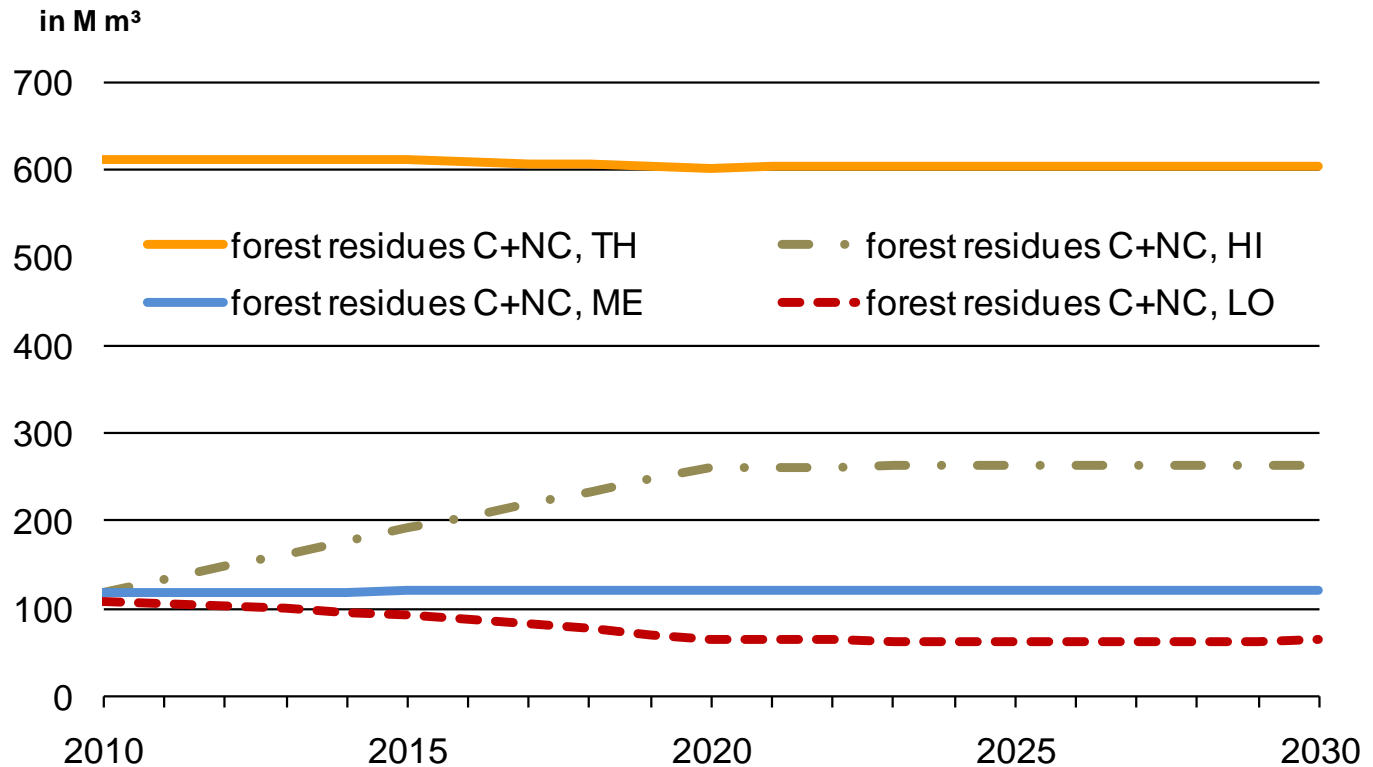


Source: Verkerk, H.; Lindner, M.; Anttila, P. & Asikainen, A. 2010: The realistic supply of biomass from forests. pp 56-79. in: EUwood - Final report. Hamburg/Germany, June 2010. 160 p.



# EUwood - How much can we use?

## 3. Developments - Constraints are most relevant for forest residues



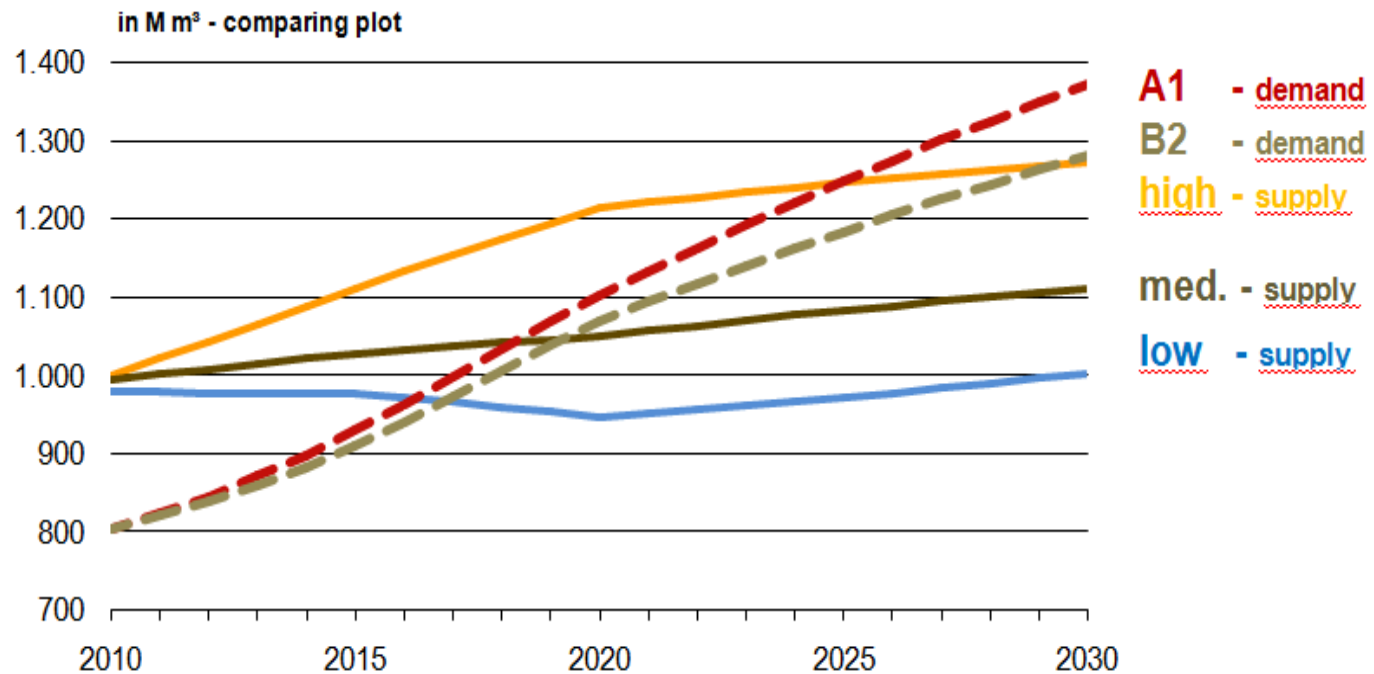
Source: Verkerk, H.; Lindner, M.; Anttila, P. & Asikainen, A. 2010: The realistic supply of biomass from forests. pp 56-79. in: EUwood - Final report. Hamburg/Germany, June 2010. 160 p.



# EUwood - How much can we use?

## 3 Developments - total woody biomass scenarios

- EU27 - total woody biomass demand and potential with low, medium and high mobilisation scenario



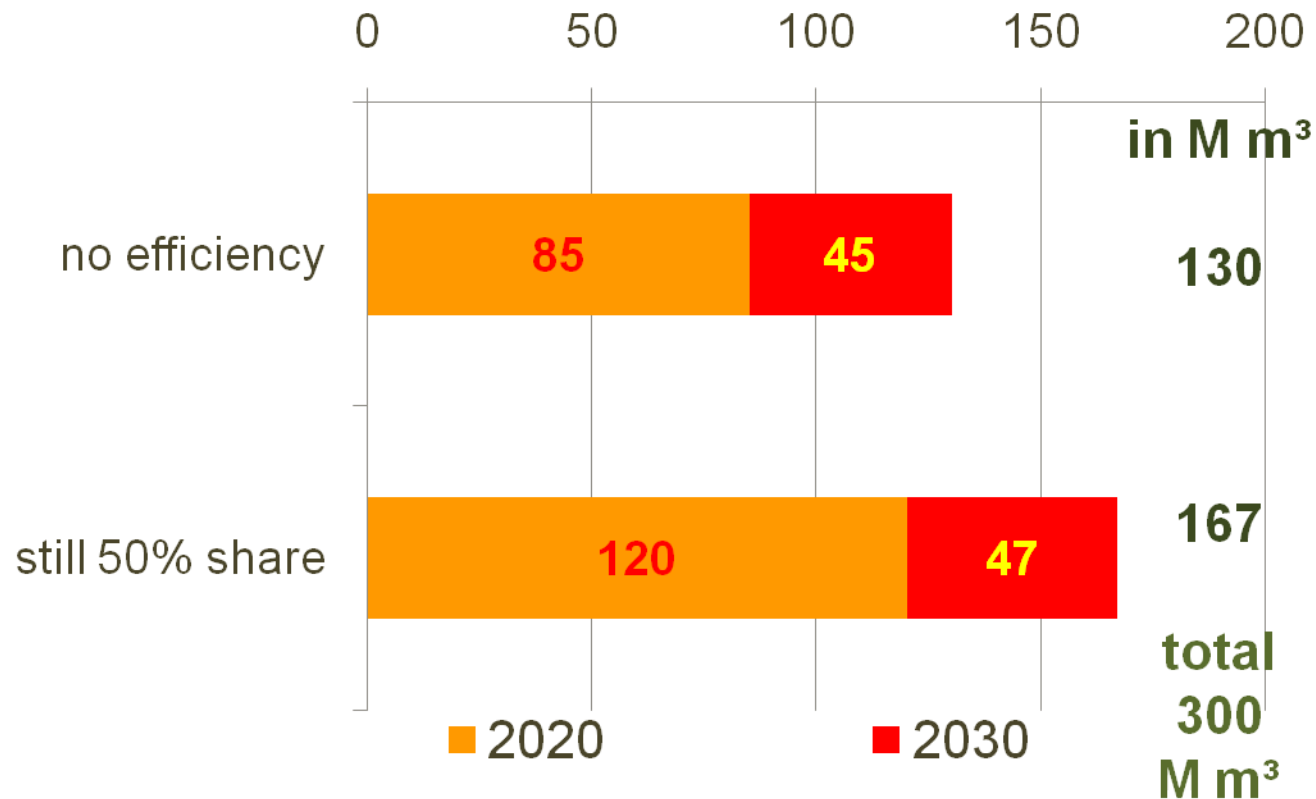
Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; LEEK, N.: Post -consumer wood; OLDENBURGER J.: Landscape care wood; SAAL, U.: Industrial residues; MANTAU/SAAL: Wood industry; PRINS, K.: Policy options; JONSSONS, R. EFSOS calculations)



## EUwood - How much can we use?

### 3 Developments - sensitivity annual difference with base scenario

How much more in case of ... ?



Source: Steierer, F. 2010: Energy use. pp 43-55. in: EUwood - Final report. Hamburg/Germany, June 2010. 160 p.



## Wood resource balance – Future research challenges

1. Priority: empirical studies in unknown markets like wood energy consumption and resource mix of consumer.

Research projects based on „existing data“!

What existing data?

Most of the used data in new markets and on used resources is still expert guessing on the basis of some randomly existing inquiries.

The less you spend in empirical data research, the less the expert knows, the more you can expect him to tell what is expected in the common sense, because that's the cheapest and most successful way to get a mission impossible done.

- maybe that's why there is no emphasis on field work
- „Model me happy and don't bother me with data!“



# Wood resource balance – Future research challenges

## 1. Priority: empirical studies Resource monitoring in relevant markets

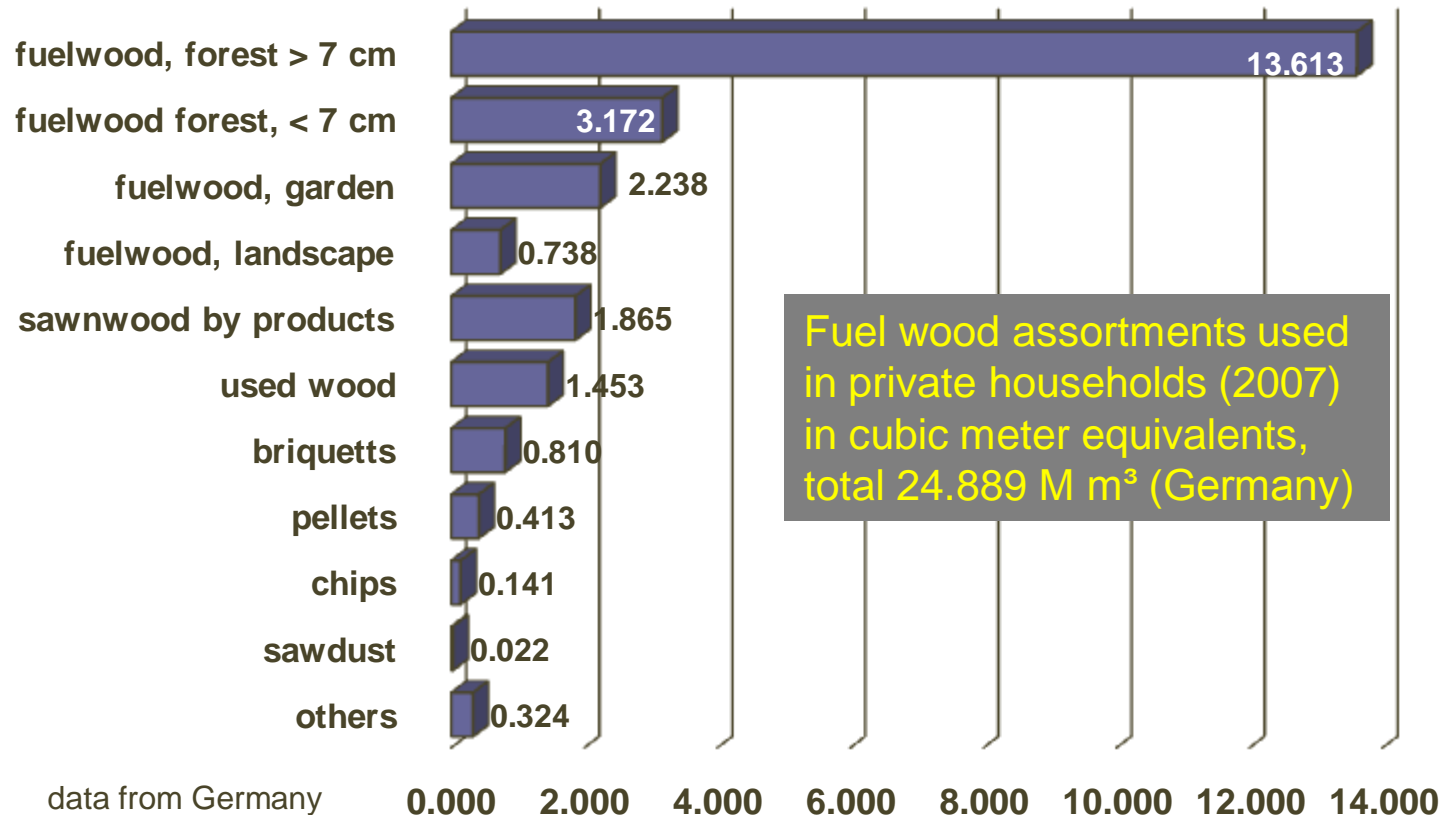
	action	statistik of return					plan		
		written questionnaires			telefon interviews		expected returns		
		addresses	Mailings	reached	rest	called	reached	plants	
<b>1</b>	saw mill industry	3,000	5,500	1,000	2,000	1,400	2.800	<b>2.200</b>	
<b>2</b>	panel industry	35	40	34	1		34	<b>34</b>	
<b>3</b>	pulp industry	11	delivered by paper association						<b>11</b>
<b>4</b>	biomass power pl. above 1 MW	1,400			1,400		1.300	<b>800</b>	
<b>5</b>	cement, coal bpp, incineration	200	370	100	100	100	200	<b>180</b>	
<b>6</b>	private households	10,000	10,000	10,000			10.000	<b>10.000</b>	
<b>7</b>	disposal companies	4,000	7,400	1,000	3,000	3,000	3.600	<b>1.300</b>	
<b>8</b>	biomass power pl. below 1 MW	535	1,100	270	265	265	240	<b>120</b>	
<b>9</b>	construction / carpenter	1,200	2,200	250	950		250	<b>250</b>	
	<b>total</b>	<b>20,381</b>	<b>26,610</b>	<b>12,654</b>	<b>7,716</b>	<b>4,765</b>	<b>18.424</b>	<b>14.895</b>	



## Wood resource balance – Future research challenges

### 2. Priority: understand the supply and consumption in detail

How much and what kind of woody biomass is used? How is it linked to sustainability (forget about „fuel wood“).



Source: HICK, A., MANTAU, U. (2008): Energieholzverwendung in privaten Haushalten. Marktvolumen und verwendete Holzsortimente - Abschlussbericht. Hamburg 2008



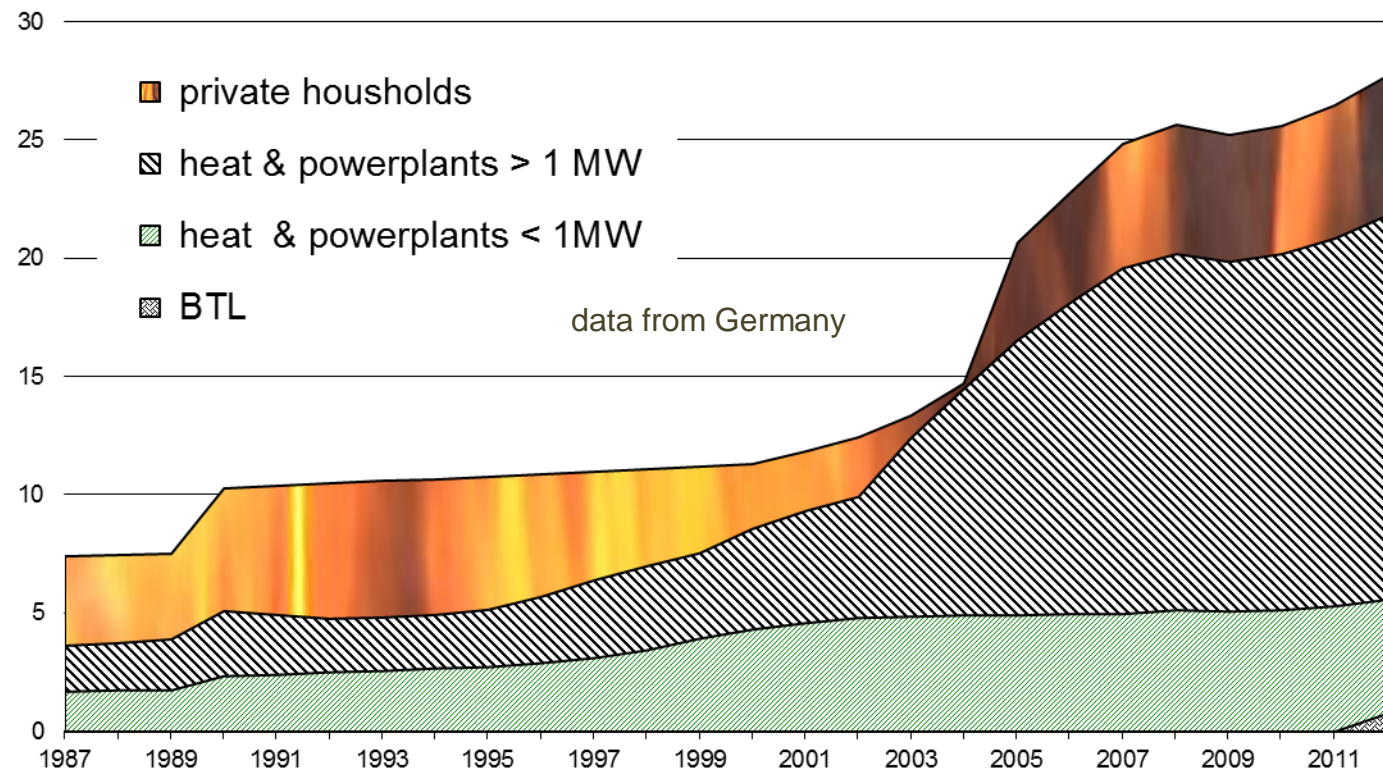
# Wood resource balance – Future research challenges

## 3. Priority: „make“ time series out of monitoring data

Empirical analyses in 3 to 5-years steps.

Additional (OPEN) assumptions to get continuous data.

in M m<sup>3</sup> (comparing plot)



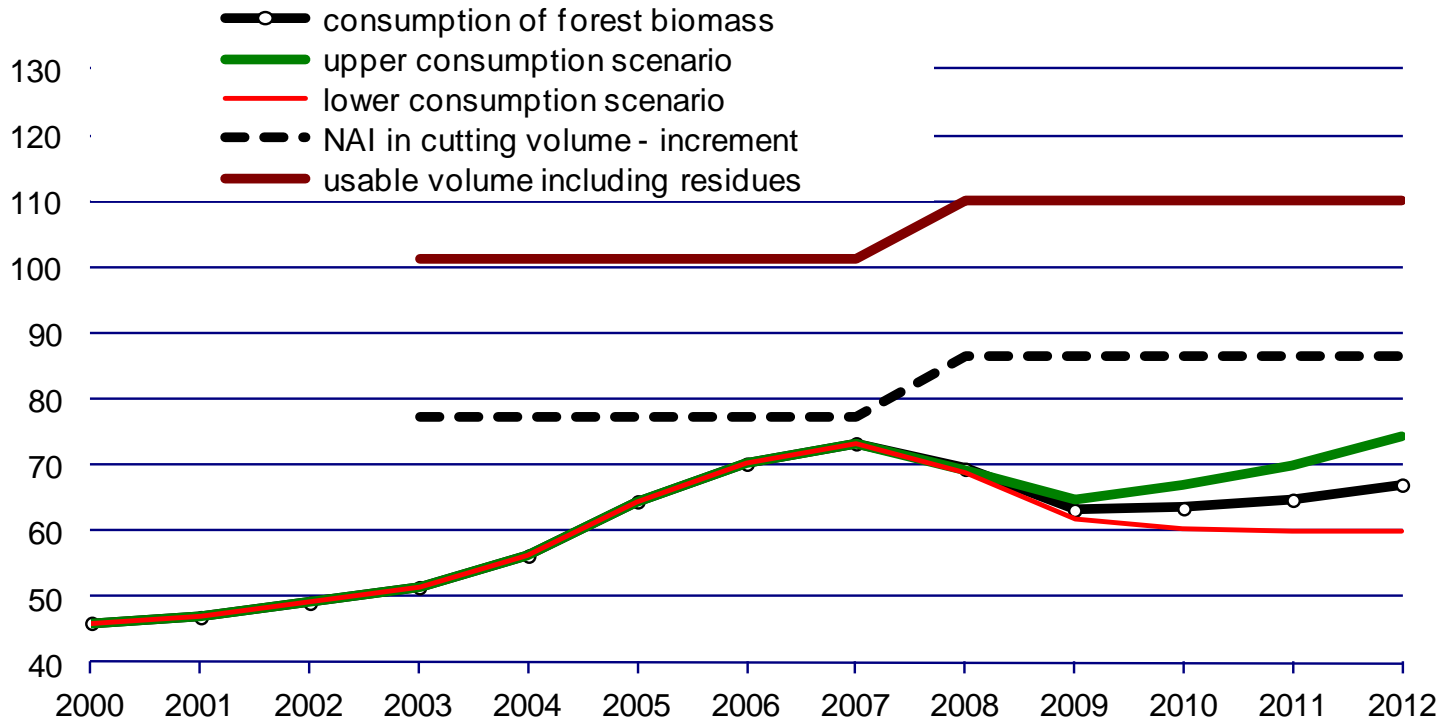
Source: MANTAU, U. (2009): Szenarien 2008-2012, Celle 2010, 75 pp.



# Wood resource balance – Future research challenges

## 4. Priority: answer political questions

How much wood do we use and how big is the reserve?

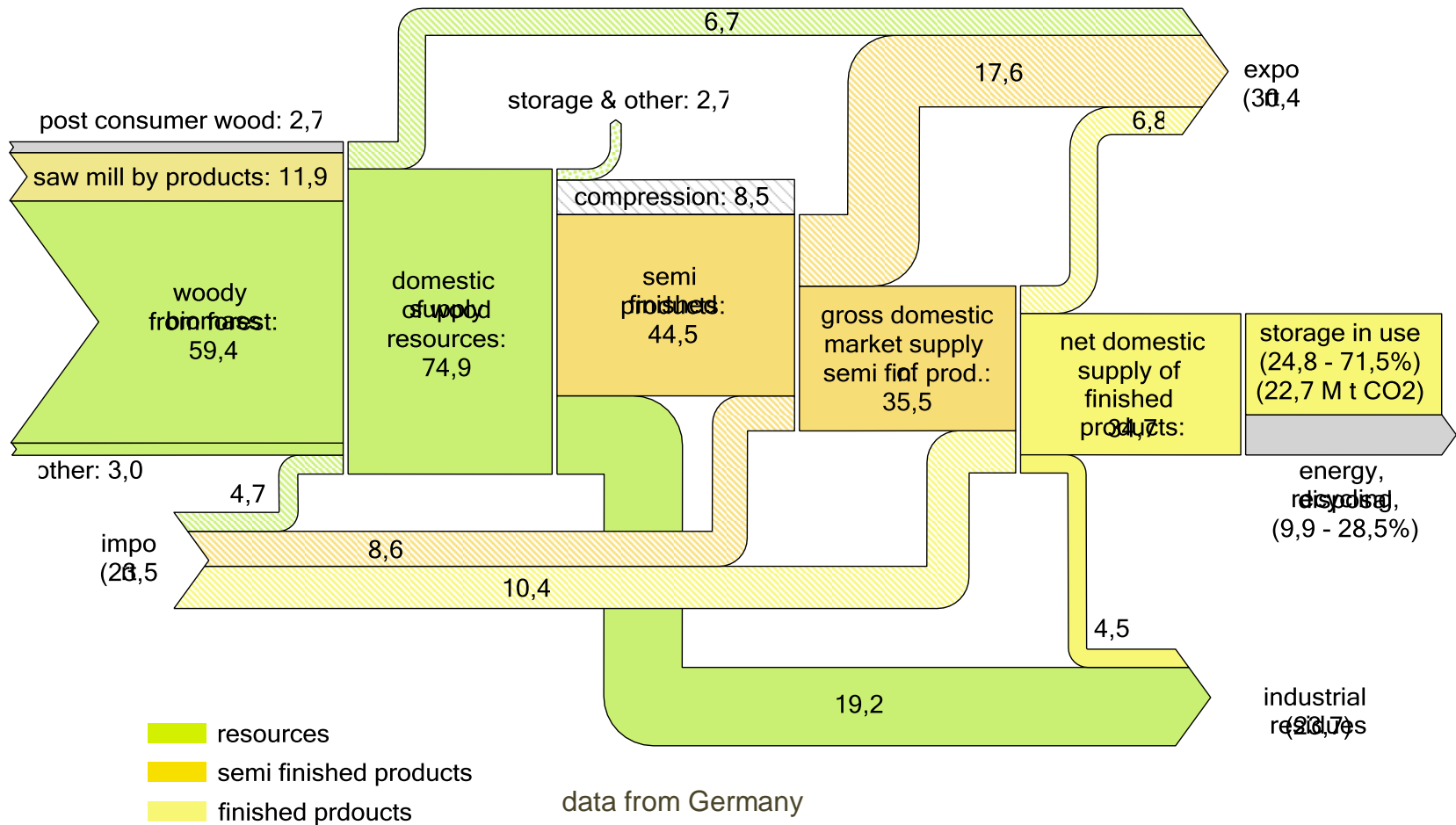


Source: MANTAU, U. (2009): Szenarien 2008-2012, Celle 2010, 75 pp.



# Wood resource balance – Future research challenges

## 4. Priority: Understand the complex nature of markets – wood flux analyses (in m<sup>3</sup> swe in Germany 2007)



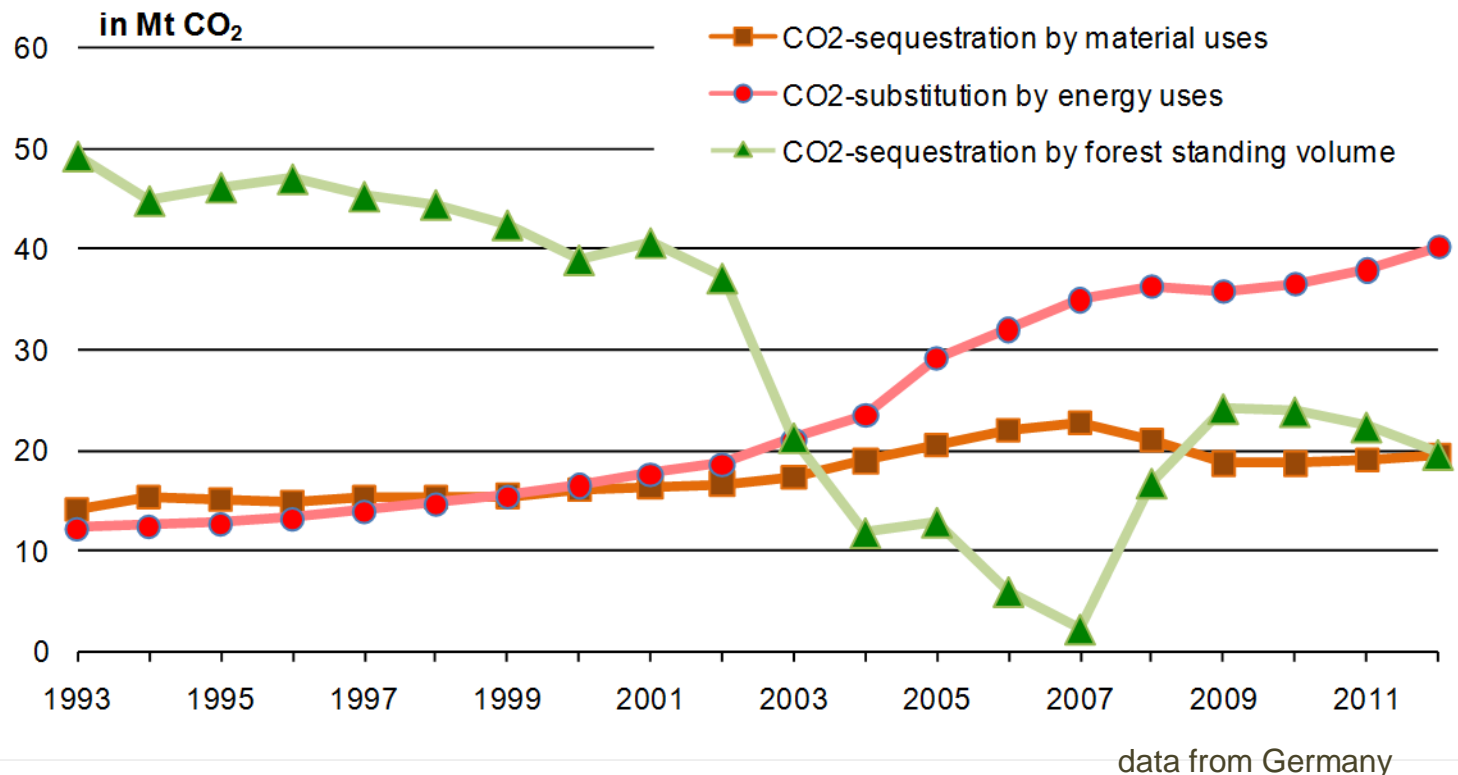
Source: MANTAU, U., BILITEWSKI, B.: Stoffstrom-Modell- Holz 2007, Celle 2010, 75 S.



# Wood resource balance – Future research challenges

## 4. Priority: give answers to political questions

### Carbon sequestration effects of woody biomass uses in Germany (1993-2012) – yearly changes in Mt CO<sub>2</sub>



Source: MANTAU, Positionierungsstudie 2008,  
MANTAU, U., BILITEWSKI, B.: Stoffstrom-Modell- Holz 2007, Celle 2010, 75 S.



### Priority summary

1. Reliable data!
2. Correct theory on market structures and flows.
3. Finally, 1 and 2 can be modeled
  - as long as the changes in 1 or 2 are not progressing faster than the analytical progress in 1 or 2!



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