Current and future use of forests

-

CO_2-calculation by consumption data

UDO MANTAU

Content

1. EUwood/EFSOS

   background and results

2. Actual state of our knowledge on resources,

   markets and future scenarios

3. CO2- calculation with consumption data

Targets of EUwood

Understanding the wood market under actual conditions (energy).

Answer the following questions:
How much wood do we need, if …

- wood industry continues to grow almost like in the past and
- national action plans (March 2010) will be realized

1. Methodology background - Wood resource balance

Dimensions

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

→ **Resource potential**		**Actual demand** ←	
717 M m³ **358 M odt** **6,238 PJ** **69 %**	 	 	**458 M m³** **229 M odt** **3,985 PJ** **57 %**

Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; STEIERER, F.: Energy consumption; 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)

1. Methodological aspects

Methods - scenarios

→ source | *use ←*

[mio. m³]	
stemwood	EFISCEN
forest residues	
bark	
Woody biom. outside for.	**Literature & modelling**
post consumer wood	
sawmill by products	**EFSOS & conv. factors**
other industrial residues	
black liquor	
Processed wood fuel	**Energy use**

	[mio. m³]
EFSOS Conversion factors and WRB	Sawmill industry
	Panel industry
	Pulp industry
	other material uses
EU RES 2020 calc. enquiries	Wood based fuel industry
	wood industry internal use
	biomass power plants
	household use
	liquid biofuels

Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; STEIERER, F.: Energy consumption; 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)

1. Wood resource balance – how big are the different sectors?

Dimensions in solid wood equivalents m³ (swe, sw, s)
not roundwood equivalent (m³ (r))

- E27 potential and demand in M m³ medium mobilisation

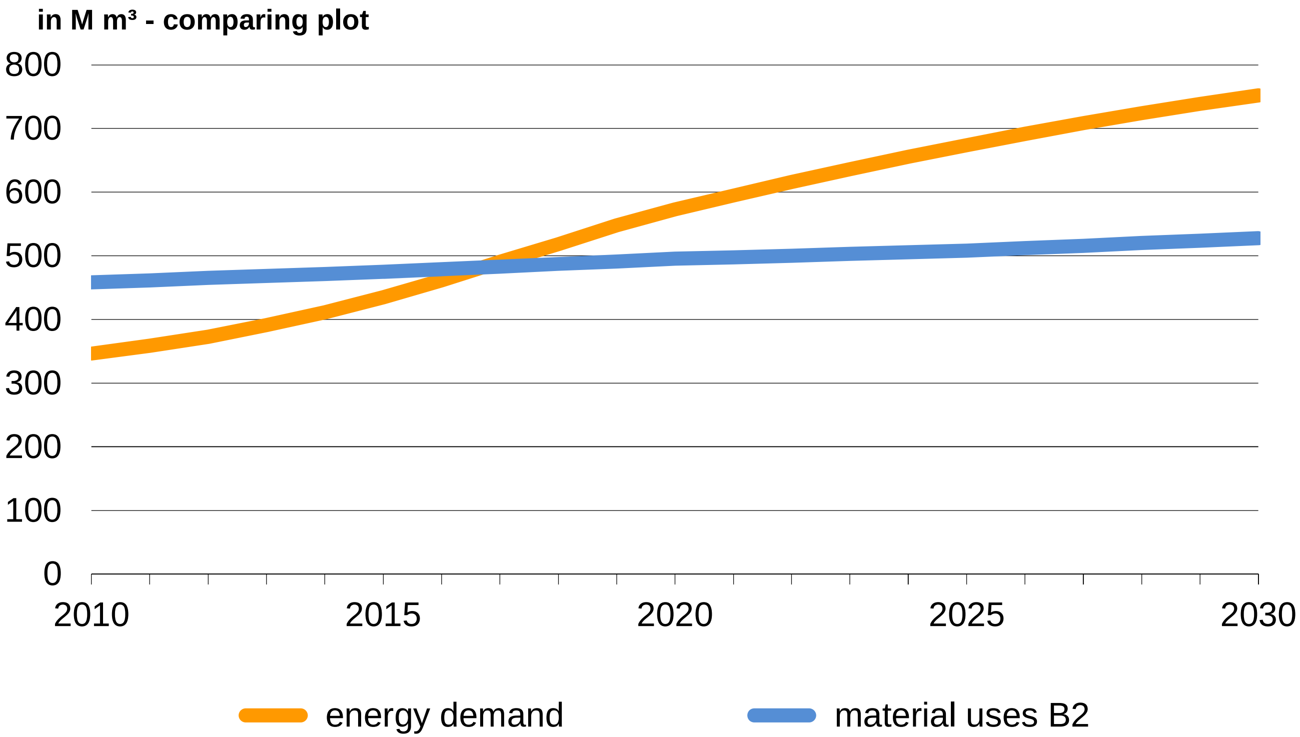
Potential in M m³	2010	%	2010	%	Demand in M m³
Stemwood C, ME	362	35.3	196	23.8	Sawmill industry
Stemwood NC, ME	182	17.7	11	1.3	Veneer/plywood industry
Forest residues, ME	118	11.5	143	17.3	Pulp industry
Bark, ME	55	5.4	92	11.2	Panel industry
Landscape c.w. (USE) ME	59	5.8	15	1.8	Other material uses
Short rotation plantation	-		21	2.5	Producer of solid wood fuels
Sawmill by products	87	8.5	86	10.4	Forest sector internal use
Other industrial residues	30	2.9	83	10.1	Biomass power plants
Black liquor	60	5.8	23	2.8	Households (pellets)
Solid wood fuels	21	2.0	155	18.8	Households (other)
Post consumer wood	52	5.1	0	0.0	Liquid biofuels
Total	1.026	100.0	825	100.0	Total

Source: MANTAU, Wood resource balance, EUwood – team 2010 (VERKERK/LINDNER/ANTTILA/ASIKAINEN: EFISCEN forest resources and constraints; STEIERER, F.: Energy consumption; 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)

2. Wood resource balance – How much can we use?

Developments - total woody biomass scenarios

- EU27 - Energy needs for NAPs (March 2010)
  and material uses (B2)



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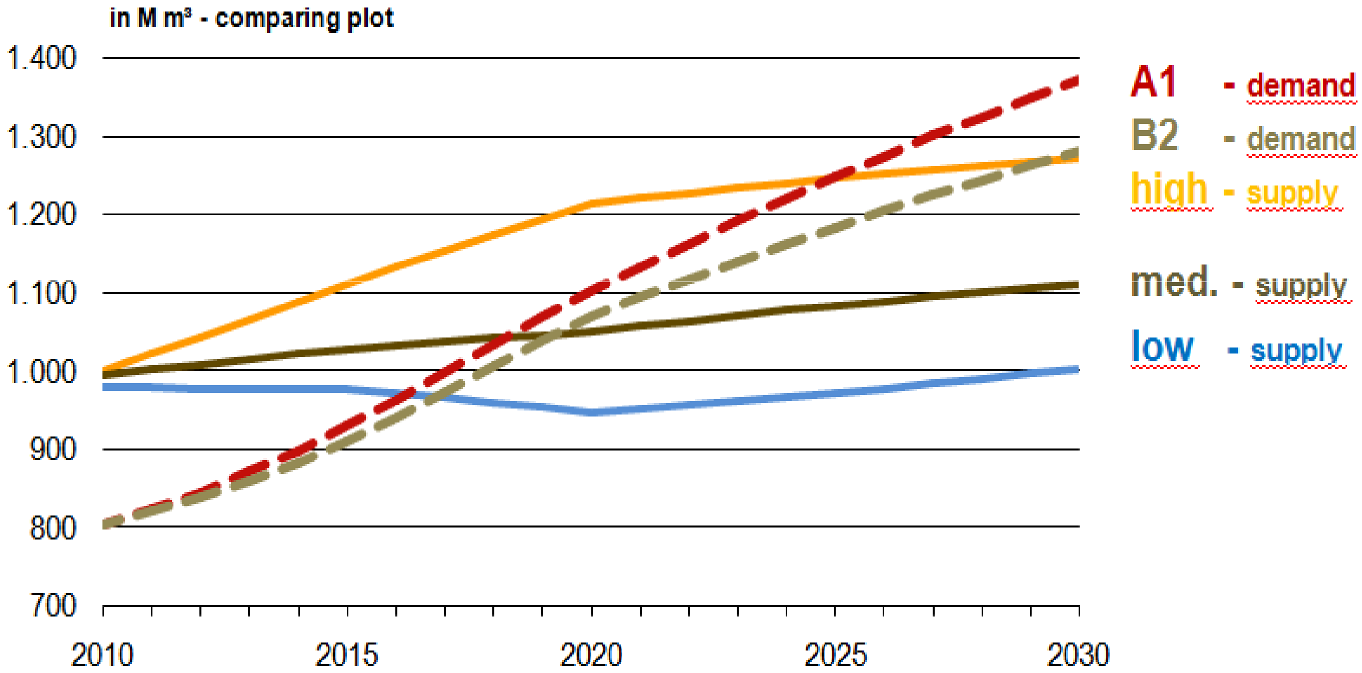
2. Wood resource balance – How much can we use?

Developments - total woody biomass scenarios

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



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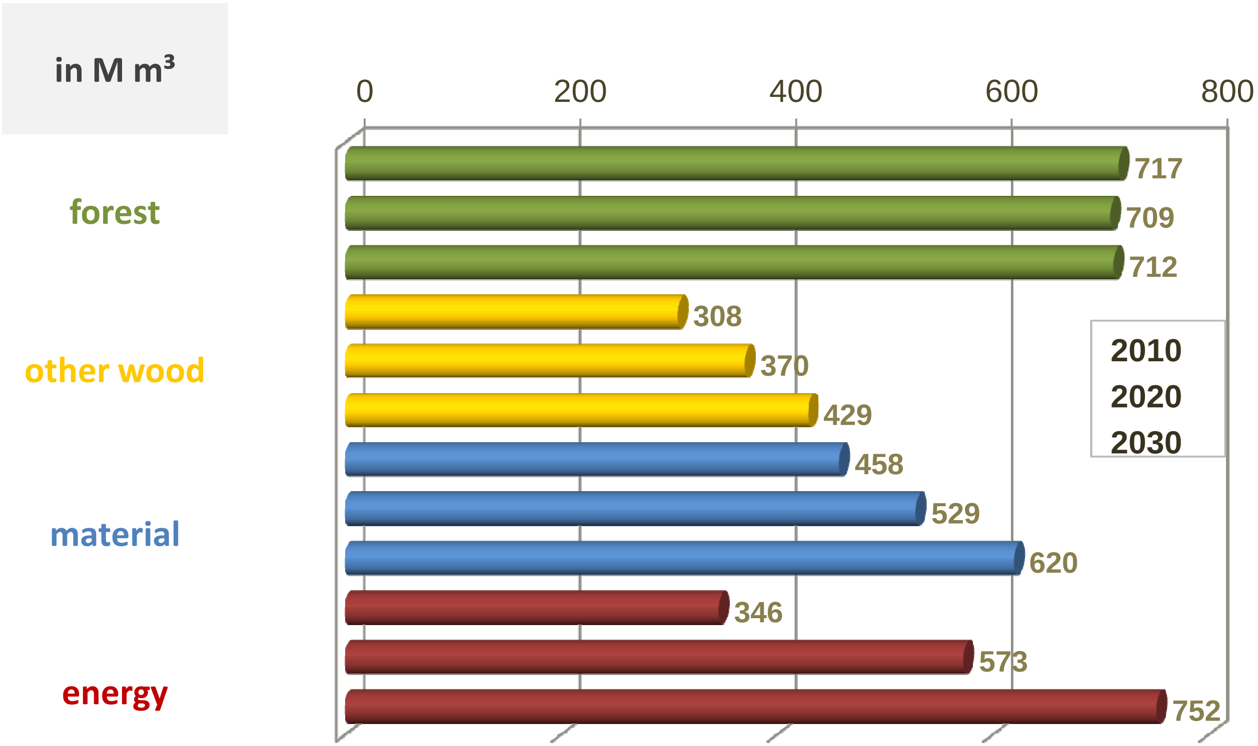
2. Wood resource sectors – How do they develop?

Developments - sectors

E27 potential supply and potential (A1) demand in M m³ medium mobilisation



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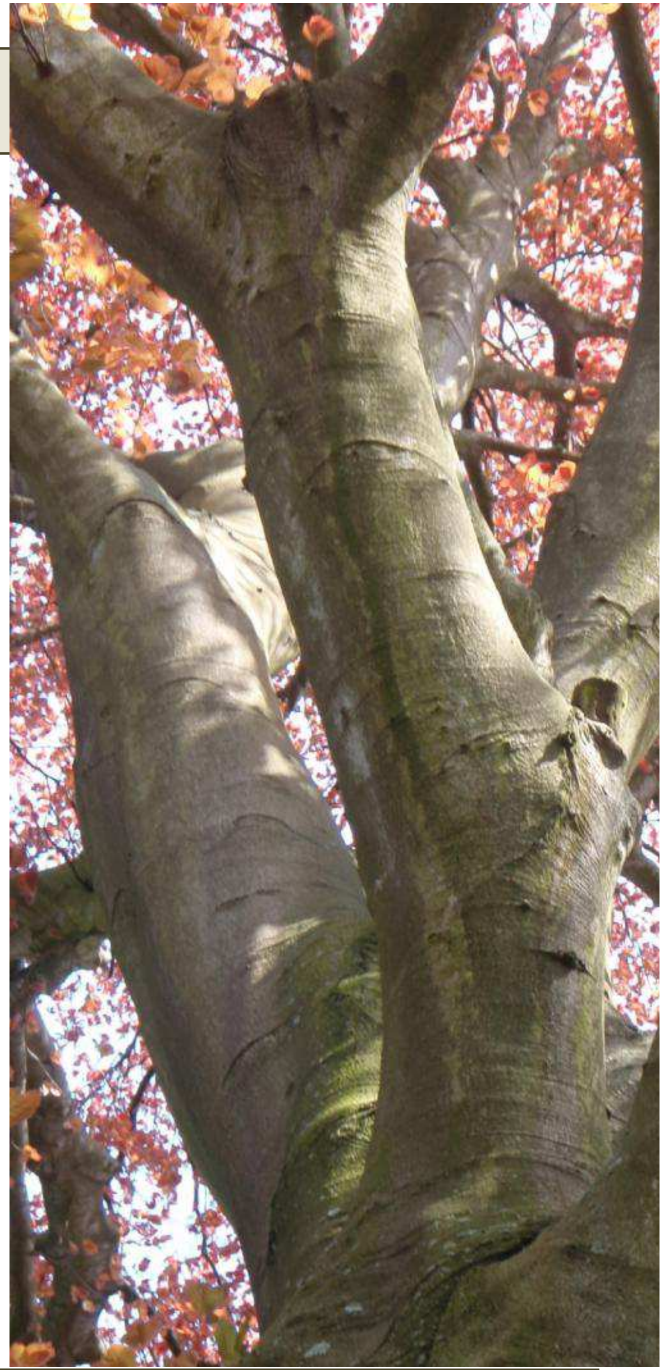
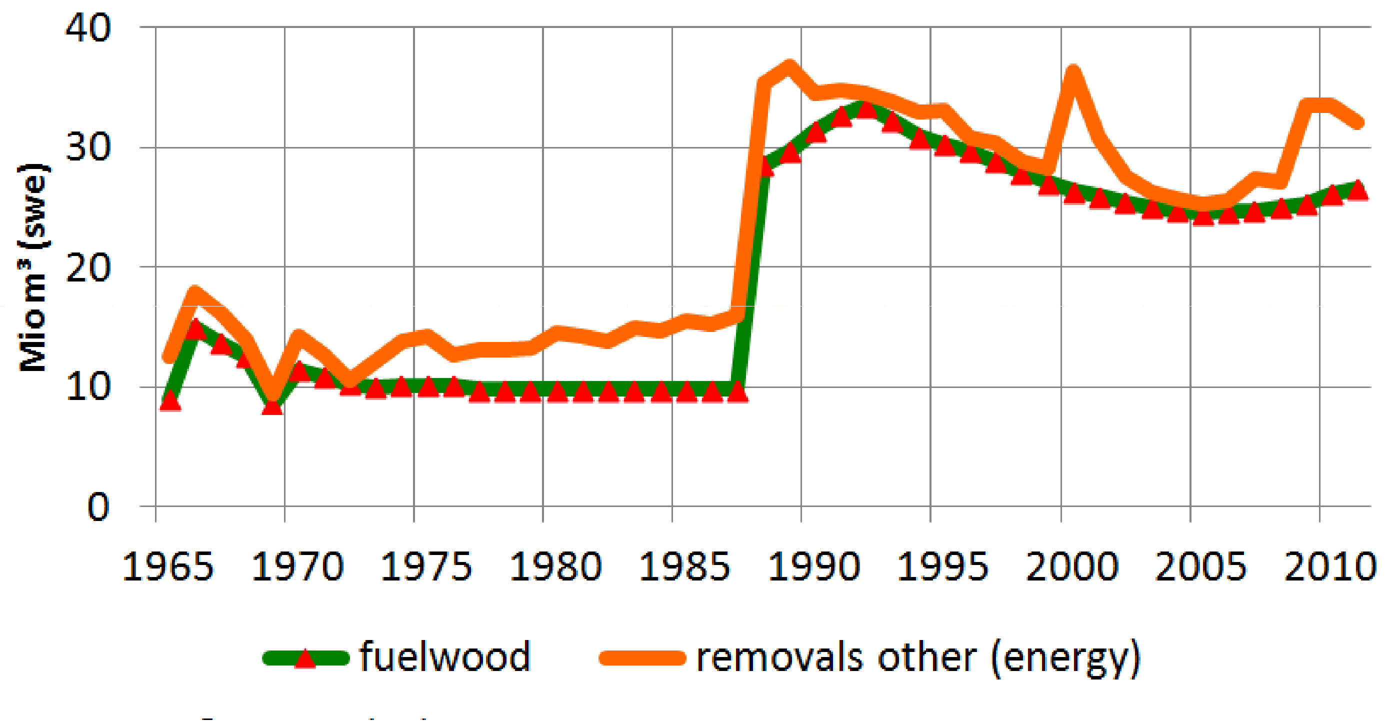
2. Actual trends

- Wood industry slowed down because of the financial crises.
- Energy consumption has continuously increased.
- Most consumption data (energy and material) are underestimated, thus even if demand decreases in some sectors/countries, the overall scarcity of wood will remain.



2. Statistical data – extimation of energy wood.

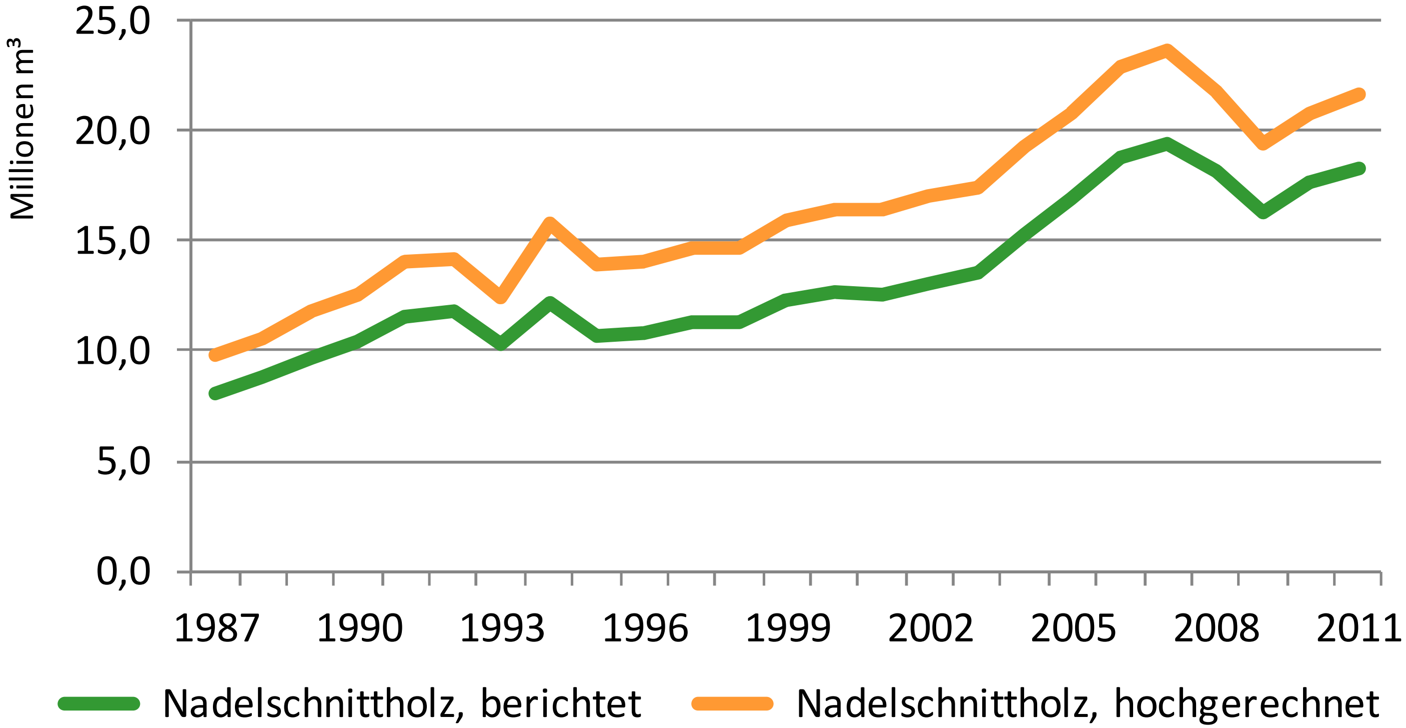
Wood utilization in France



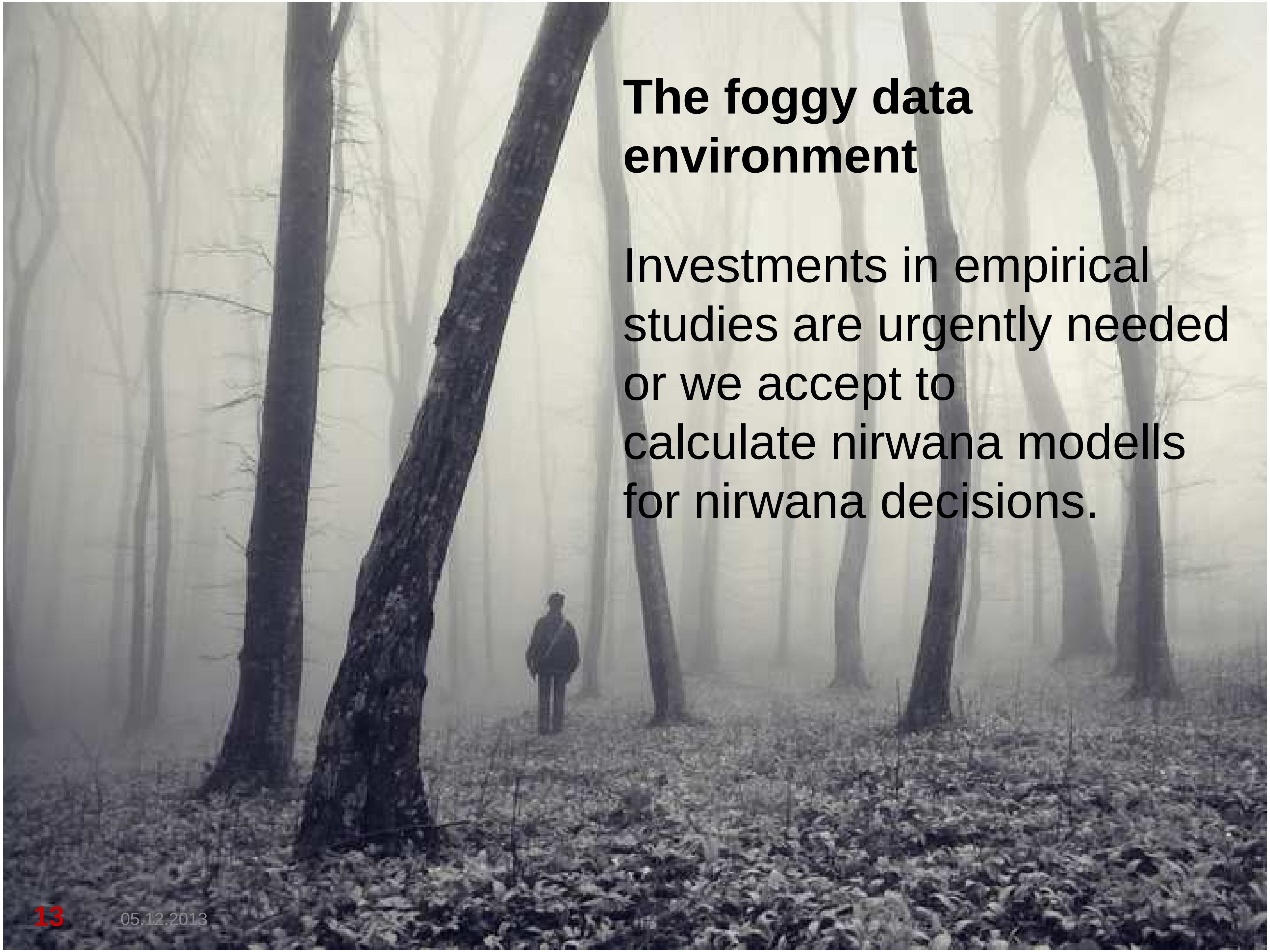
Source: own calculation based on FAO - Forestry – Databank (2012)

2. Statistical data – material uses

Development of softwood lumber
reported by „Statistisches Bundesamt“ and
calculated volume based on complete inventory counting in M m³



Source: Mantau, U. (2012): Wood resource balance Germany: Development and Scenarios 2012

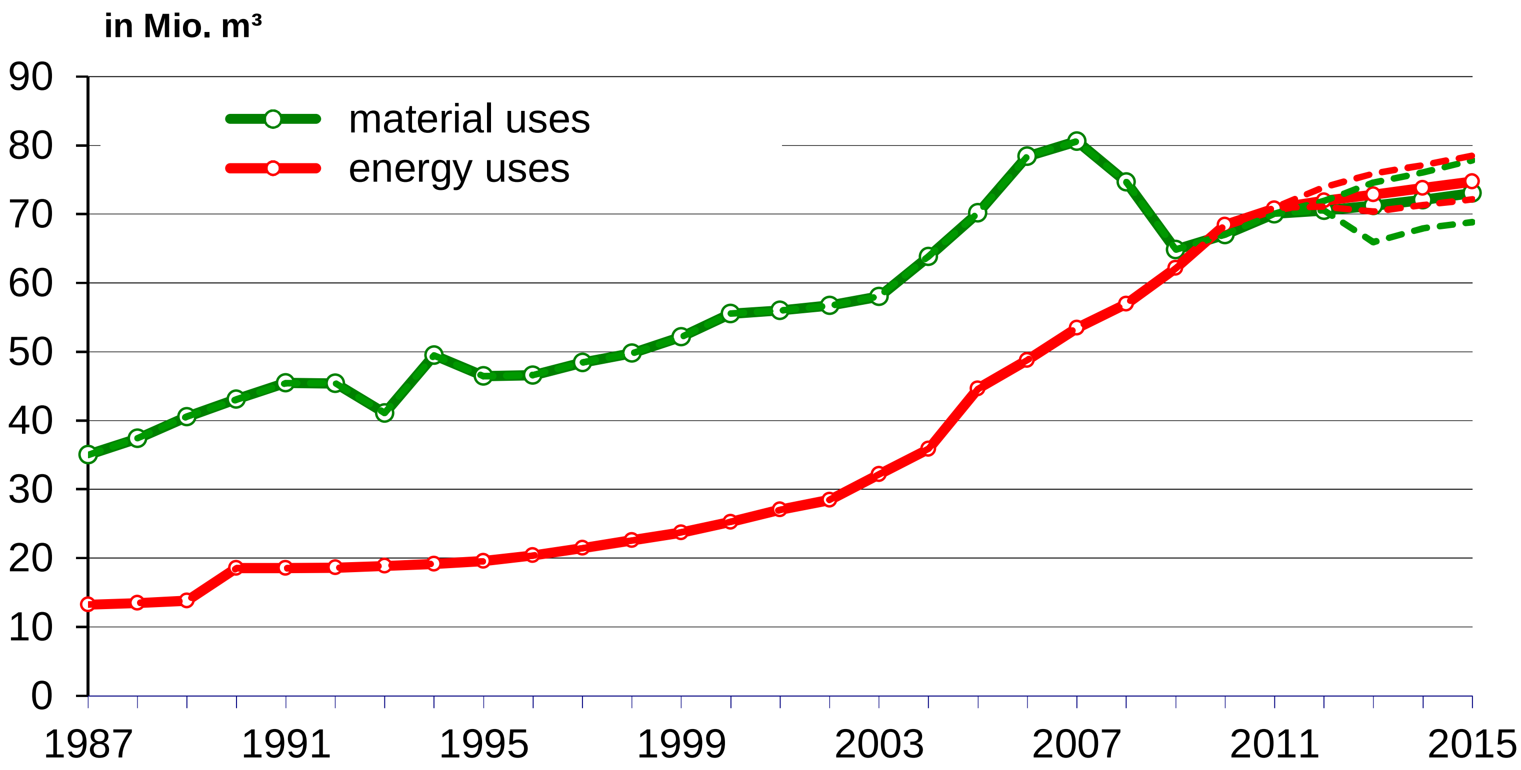


The foggy data environment

Investments in empirical studies are urgently needed or we accept to calculate nirwana modells for nirwana decisions.

2. Actual demand developments in Germany

Development until 2010 and szenarios 2015
Woody biomass from forest and from other sources



Source: Mantau, U. (2012): Wood resource balance Germany: Development and Scenarios 2012

CO2- calculation with consumption data

1. Wood flow analysis

2. Dynamic CO2 calculations
   by consumption data

3. CO2- in end-use sectors

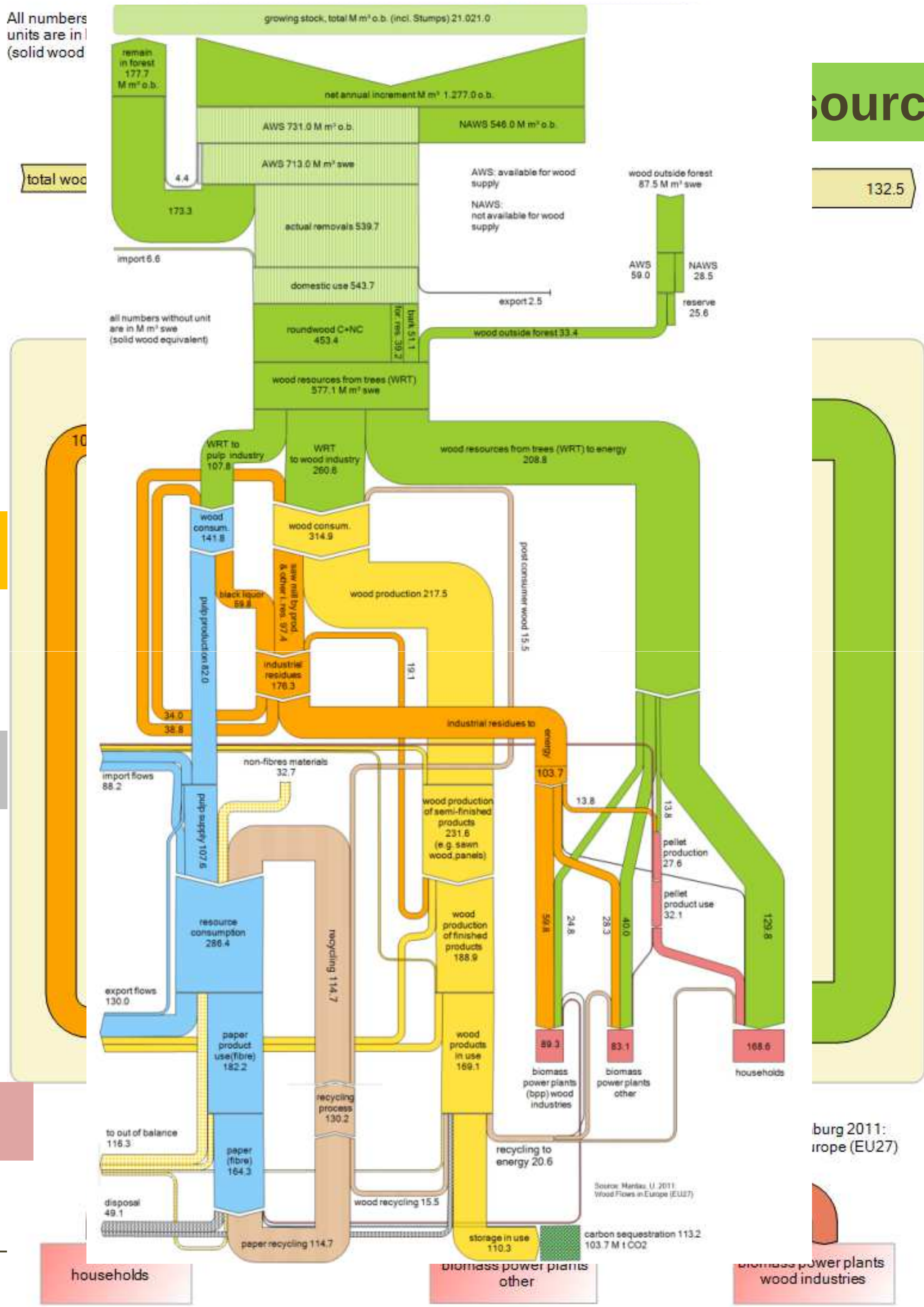
3. Flows 2010

The executive (condensed) version

cascades

recycling

energy

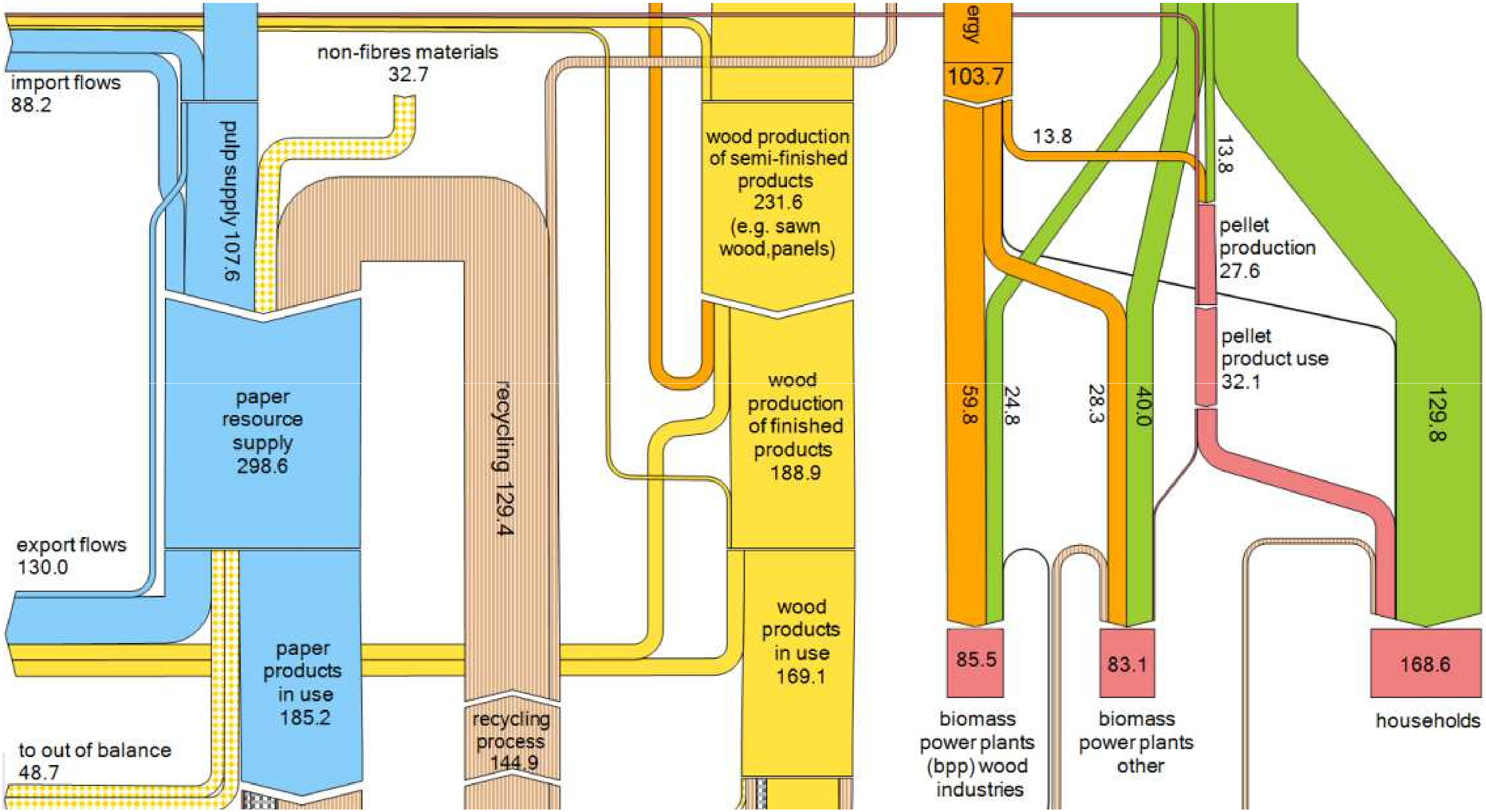


disposal

CO2

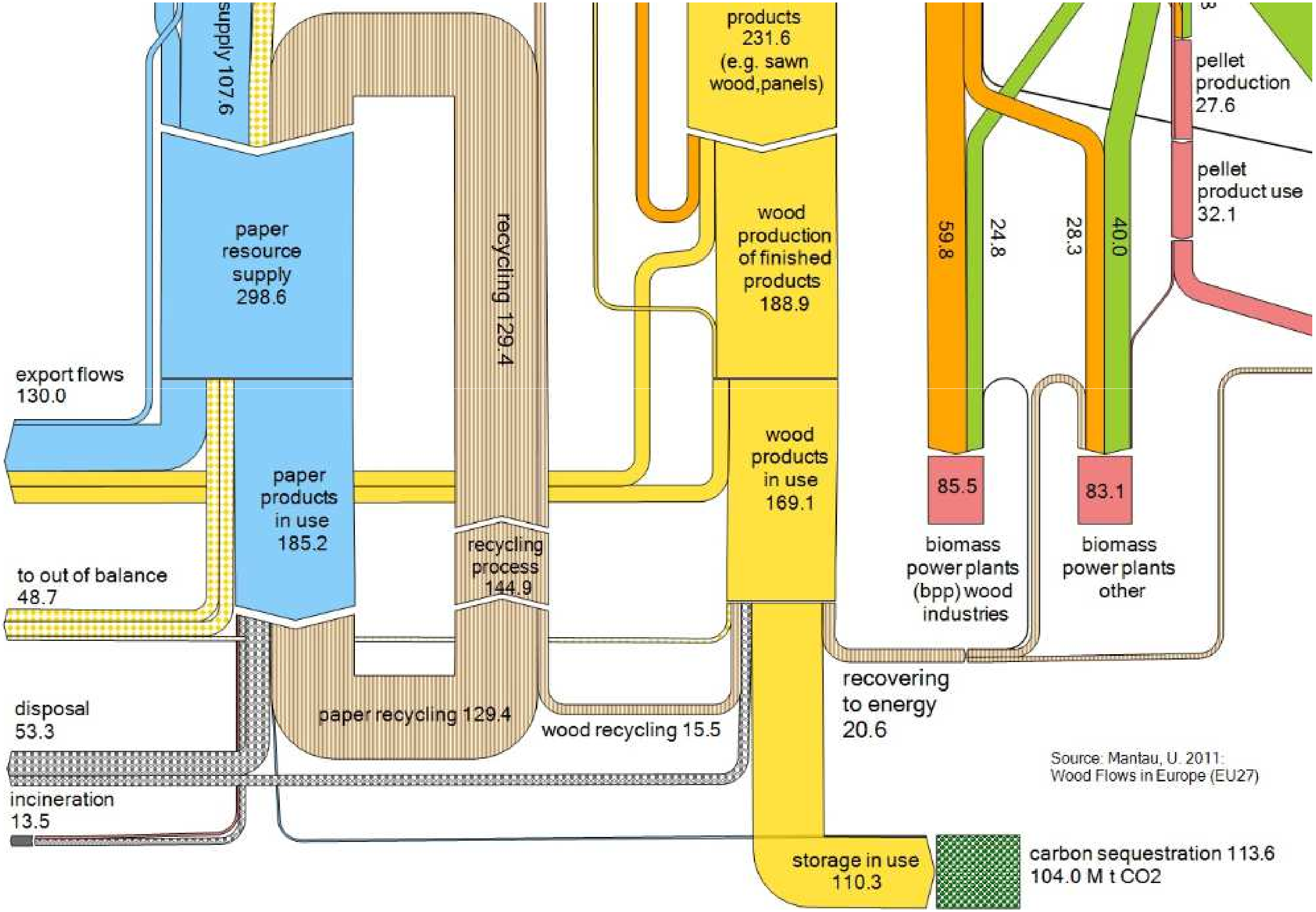
3. Wood-flow analysis in the wood resource balance

Finished products and energy



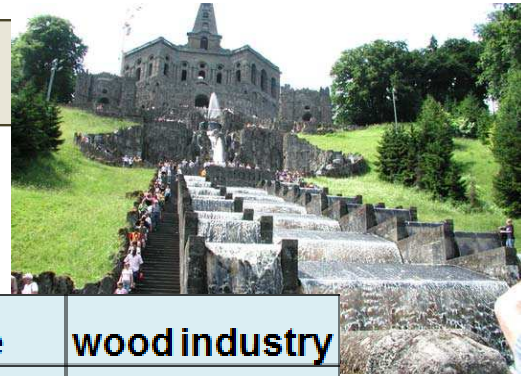
3. Wood-flow analysis in the wood resource balance

Recycling, disposal and storage in use (CO2)



Source: Mantau, U. 2011: Wood Flows in Europe (EU27)

Results and policy aspects



Cascades and utilization factors (B-I)

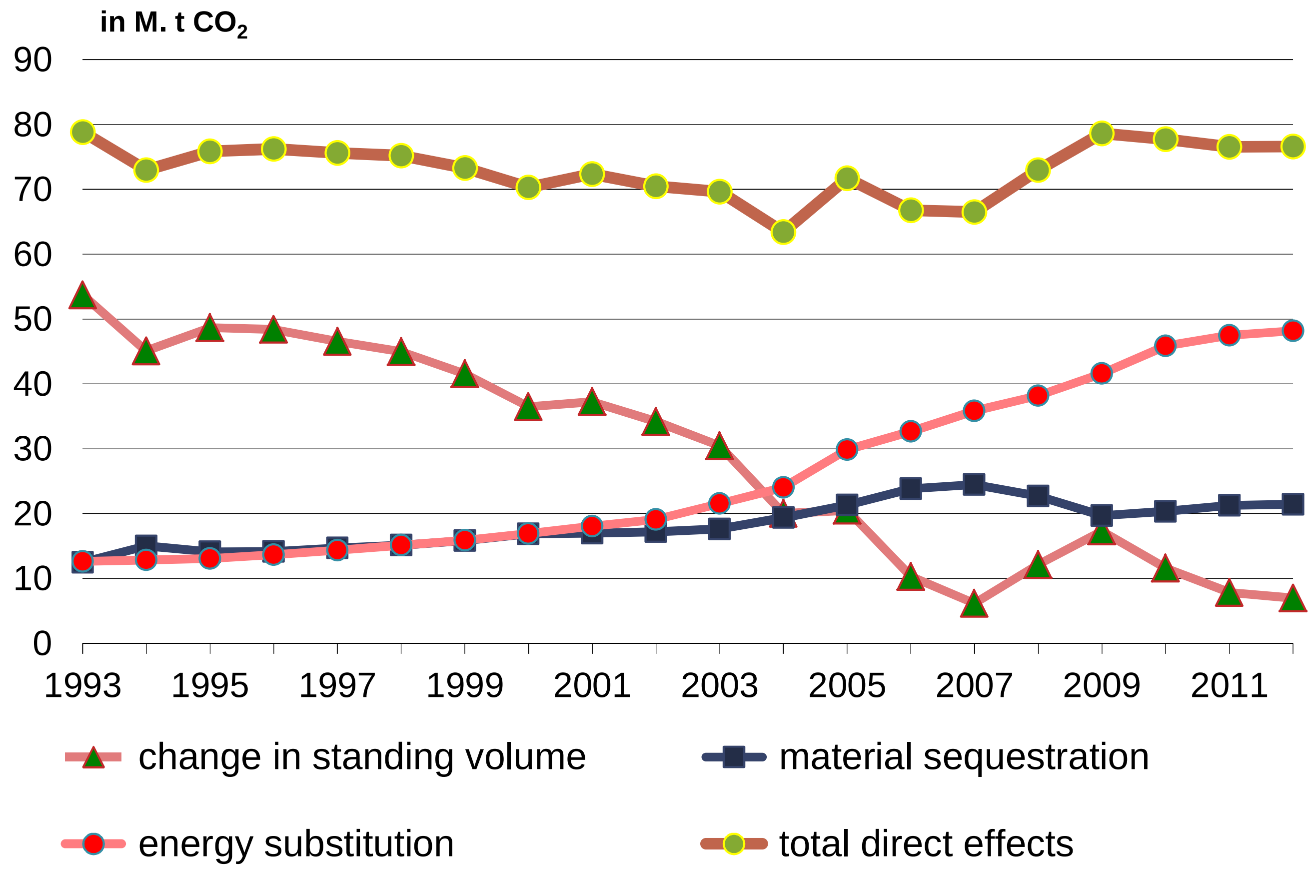
	utilization factors	wood resource balance			wood industry	
	2010	M m³	factor	calculation	M m³	factor
A	wood resources from trees	577,1			368,4	
B	residues in wood products	72,9	1,13	(A+B)/A	72,9	1,20
C	residues in energy	103,4	1,18	(A+C)/A		
D	recycling in products	130,2	1,23	(A+D)/A	130,2	1,35
E	recovery in energy	24,4	1,04	(A+E)/A		
F	residue utilization	176,3	1,31	(A+B+C)/A		
G	recycl. + recov. cascades	154,6	1,27	(A+D+E)/A		
H	cascades in products	203,0	1,35	(A+B+D)/A	203,0	1,55
I	resid. + recylc. in energy	127,9	1,22	(A+C+E)/A		
J	total cascades	330,9	1,57	(A+H+I)/A		

Cascade factor of the Wood Resource Balance: 1.57

3 Wood flow – carbon sequestration effects (Germany)

CO2-effects of wood utilization (direct yearly effects)

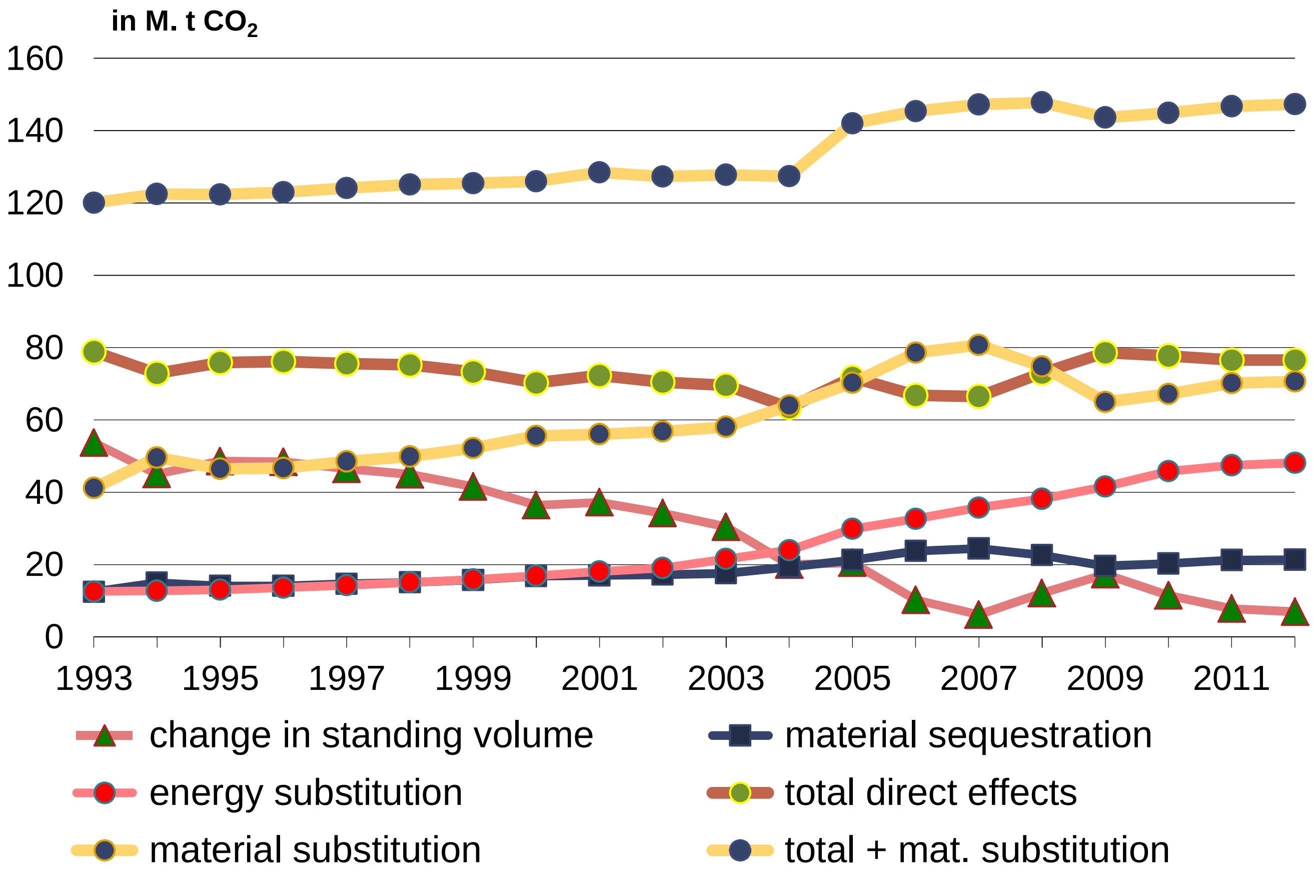
Even „apples and oranges“ can help to understand the interaction



MANTAU, U.: based on Research report: „Szenarien 2008-2012“ and Wood Resource Balances

3 Wood flow – carbon sequestration effects (Germany)

Total CO2-effects of wood utilization
(direct yearly effects + material substitution)



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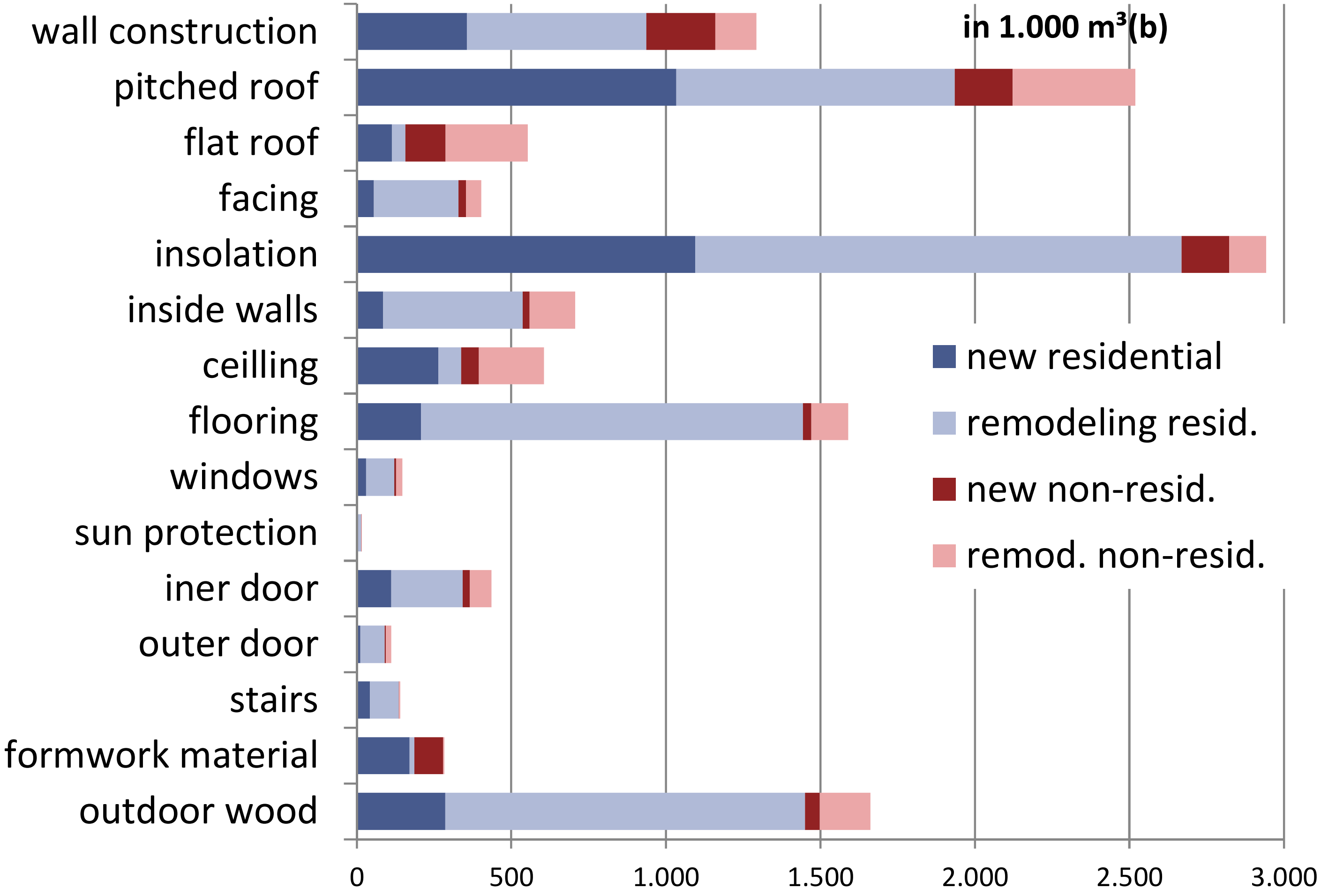
3 Yearly carbon sequestration in buildings (Germany 2012)

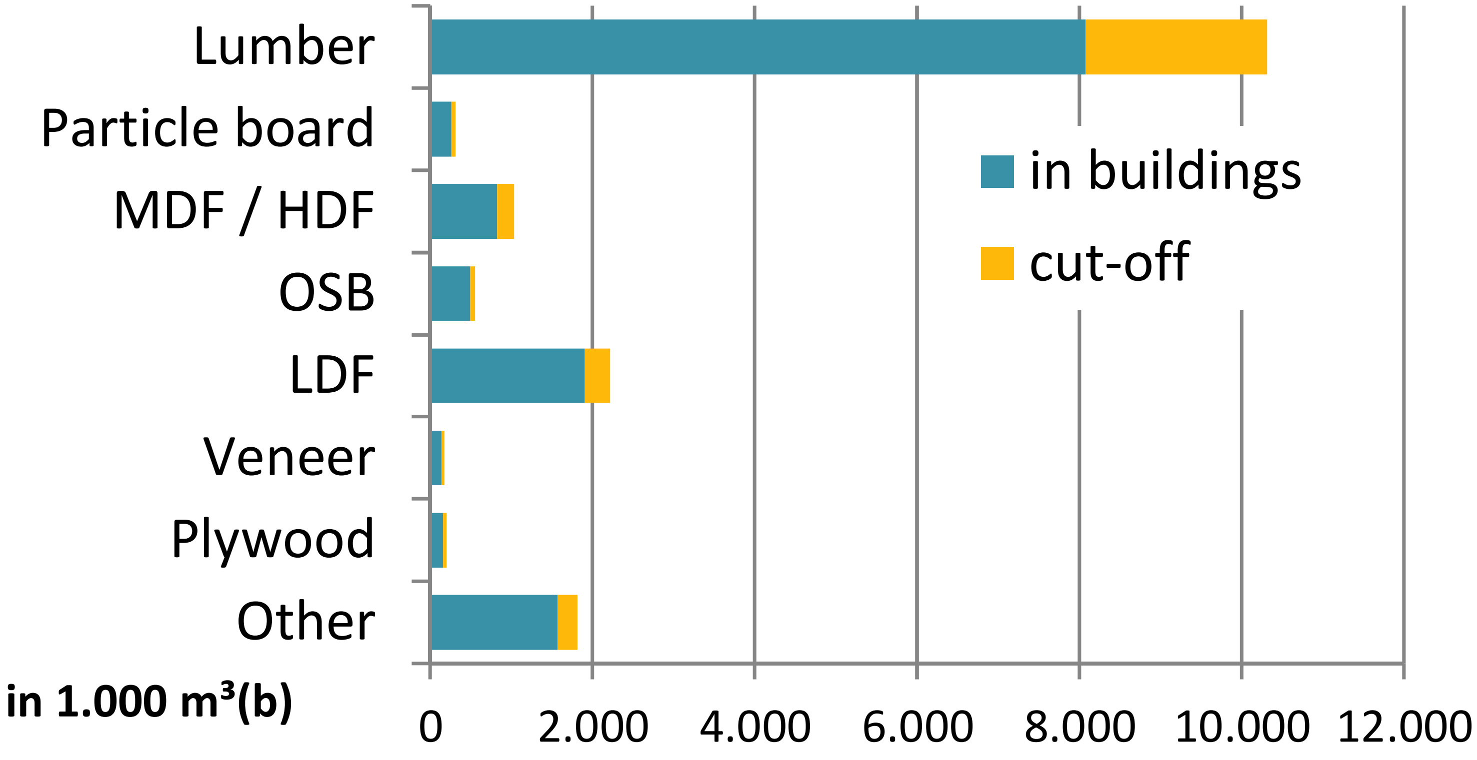
Construction subsections and their sequestration potential in 1,000 m³ (b)



Mantau U, Döring P, Hiller D (2013) Holzeinsatz im Bauwesen – Verwendungsstrukturen nach Gebäuden und Gewerken. In: Weimar H, Jochem D. Holzverwendung im Bauwesen - Ein Projekt der "Charta für Holz". Hamburg 2013

3 Yearly carbon sequestration in buildings (Germany 2012)

Total wood -effects of wood utilization (direct yearly effects)

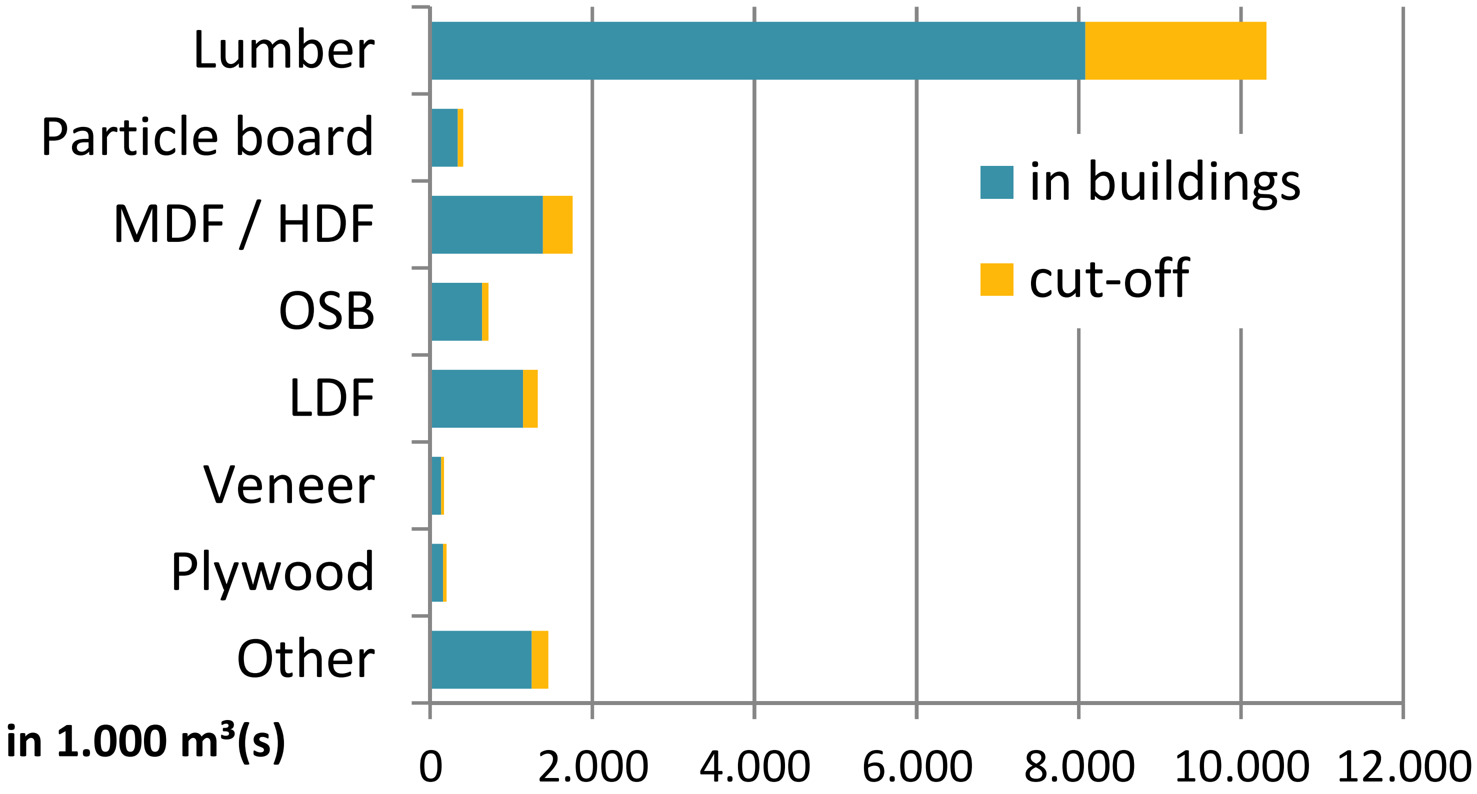


MANTAU, U.: based on research report: „Szenarien 2008-2012“ and Wood Resource Balances

3 Yearly carbon sequestration in buildings (Germany 2012)

Total wood -effects of wood utilization (direct yearly effects)

m³ (b) building cubic meter and m³(s) solid wood equivalent



MANTAU, U.: based on research report: „Szenarien 2008-2012“ and Wood Resource Balances

Biogenic carbon accounting

What consumption data can tell us.

- Wood utilization from forest can be calculated more completely with consumption data then with removal statistics.
- The interrelation between CO2 relevant sectors can be documented with consumption data.
- Consumption rates in end-use sectors identifies the sequestration potential and our understanding how to influence sequestration with our consumption behavior.

Biogenic carbon accounting

What consumption data can NOT tell us.

- The CO2-effects of production, transportation … .
- Growth-effects in forests …
- Calculate consumption data without empirical input.

Biogenic carbon accounting

What to do?

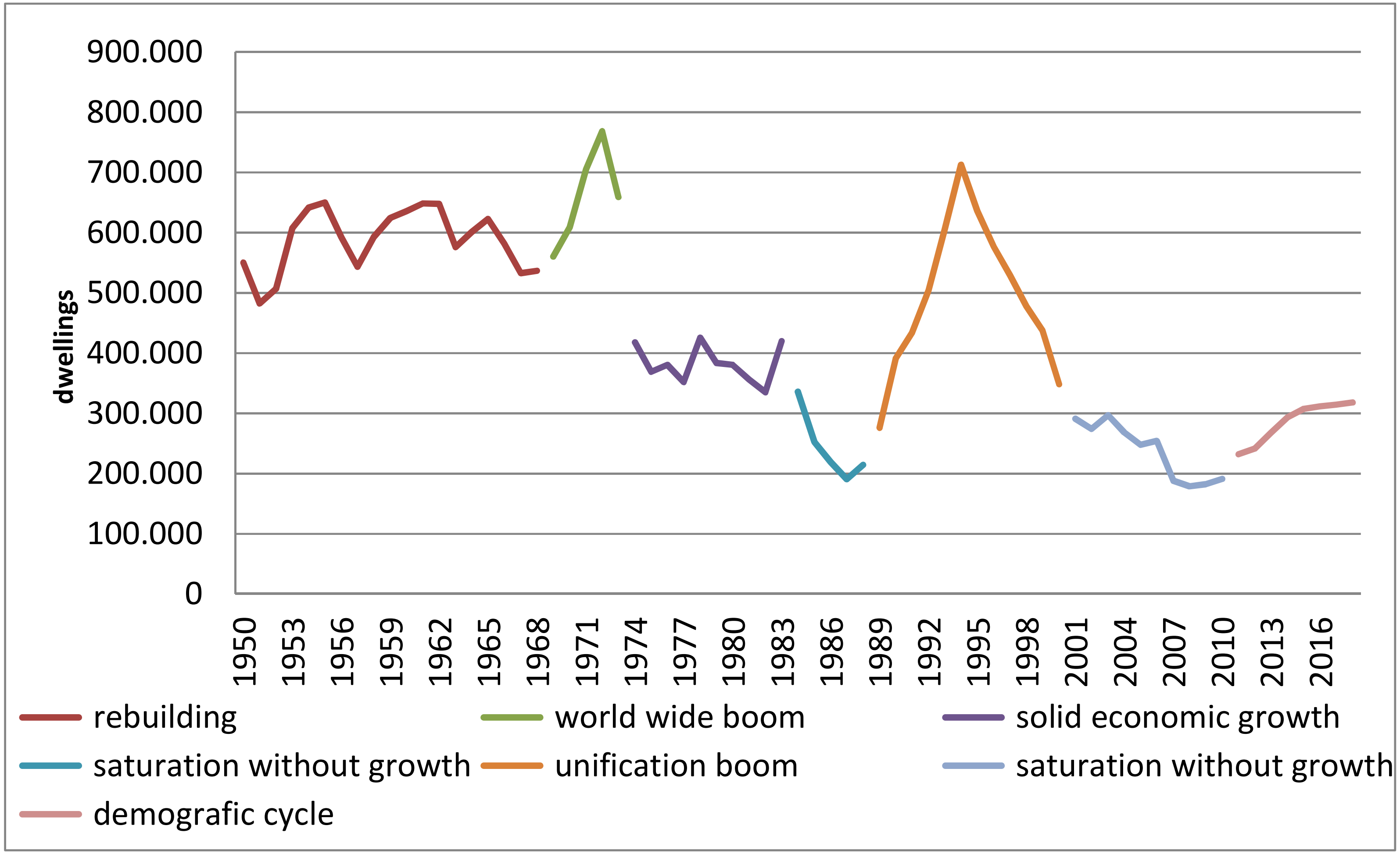
- Use consumption data as a continuous monitoring system..
- Use technical methods (LCA …) to correct consumption by increasing (substitution effects) and decreasing (emissions) the “direct” effects to its realistic net effects.
- Build a promotion group (EEA, UNECE, DG, institutions…) to support thre financing of empirical studies..

In forestry cubicmeters are not the whole story, but without knowing them – there is no story at all !

3.

When will carbon be released?

Building phases in the German market und number of dwellings



MANTAU, U. / Heinze Marktforschung - Mittelfristprognose