

Sustainability Performance Measurement for High Reliable Composite Wood Structures made of Fibre-reinforced Plastics, Technical Textiles and Compressed Wood

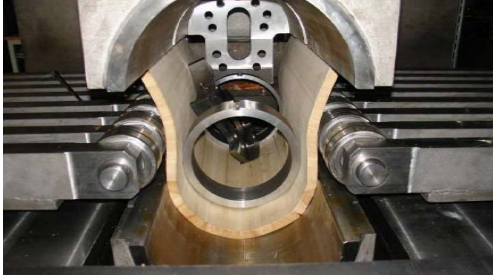
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Berlin, erscp 2008, 24.09.2008

- introducing reinforced timber profile
- TU Dresden, EMA: Life Cycle Assessment and Life Cycle Costing
- first results



- developing a new composite material based on the *renewable resource* wood (high material efficiency, yield of raw material almost 100%)
- high performance
 - load carrying capacity
 - durability, weathering resistance due to reinforcement
- entering a new market for wood
 - Traditional application: doors, windows, houses
 - Advanced application: bearing structures (bridges, roofing)
- economic, ecological investigation (LCA/LCC)
 - Does the new building material meet the needs of sustainability?





Forming the profile (pilot plant)



Reinforcement



Using available LCA data for "Cradle to wood"	Making the wood processible for GLT-Production	Producing a GLT board	Preparing the GLT board for the forming process	From board to profile	Using Epoxy and Fibre
					

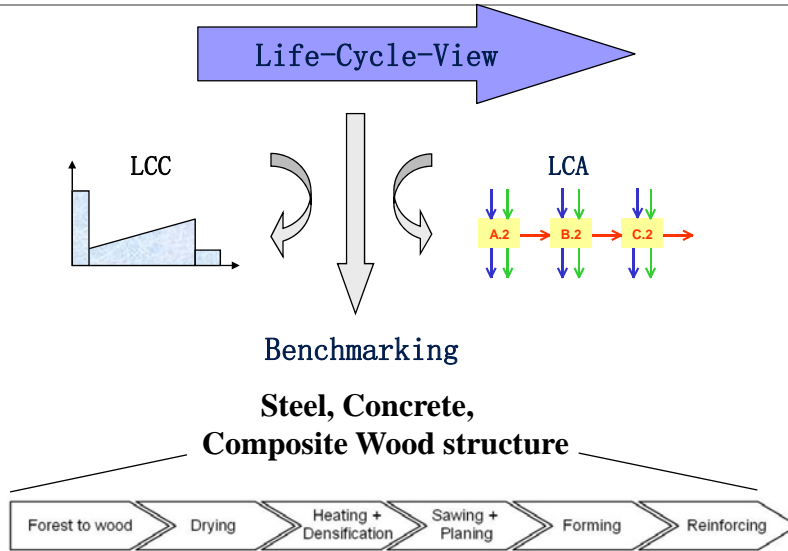
assets	liabilities	
fixed assets	visible equity	} visible part of the balance sheet
inventory	accruals	
receivables	long-term debt	
cash on hand	short-term debt	
used environmental resources	invisible equity	} invisible part of the balance sheet
	invisible obligations	
	obligations to society	


following Sveiby (1997)

1. step: ***Differentiated Economic Value Added***
 presentation of recognized environmental resources in traditional managerial and financial accounting (here: LCC)

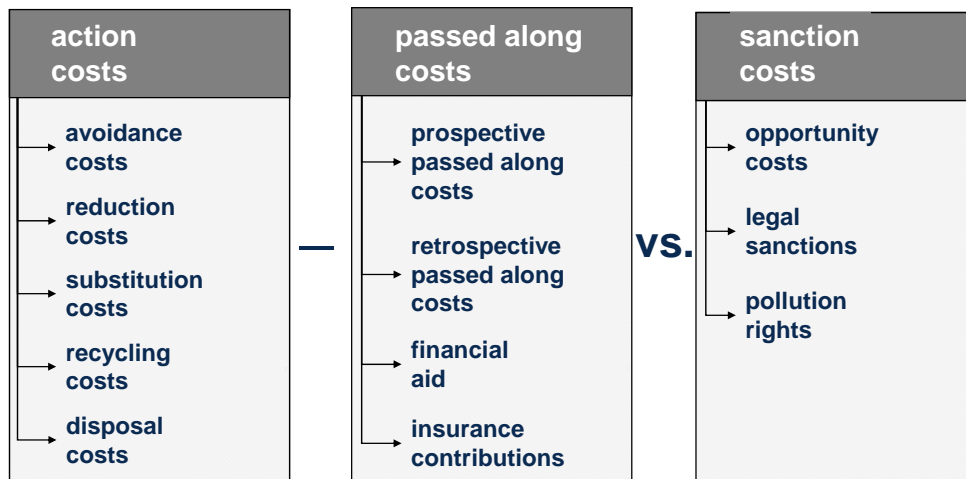
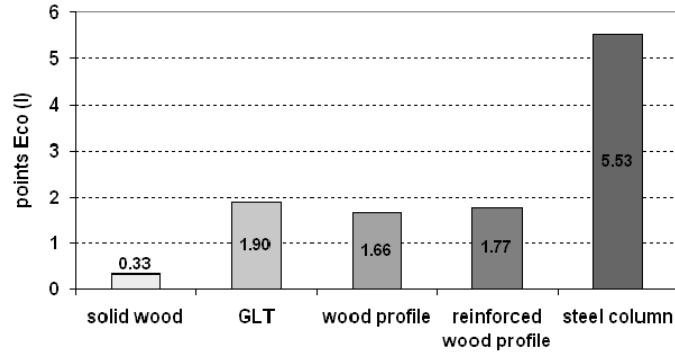
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2. step: ***Adjusted Economic Value Added***
 presentation of not recognized environmental resources in decision tools based on a monetary assessment (e.g. capital charge) (here: environmental LCC)

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3. step: ***Extended Economic Value Added***
 presentation of not recognized environmental resources in decision tools based on non-monetary assessments (here: LCA)



Forest to wood	Drying	Heating + Densification	Sawing + Planing	Forming	Reinforcing
Using available LCA data for "Cradle to wood"	Making the wood processible for GLT-Production	Producing a GLT board	Preparing the GLT board for the forming process	From board to profile	Using Epoxy and Fibre
LCA Wood (DGfH) SimaPro®	LCA Wood / GLT (DGfH) Production data (Hess Wohnwerk GmbH)	TU Dresden: Measures Pilot plants	TUD / ISH, Hess Wohnwerk GmbH	Pilot plant: "measures, calculations, estimations"	 <ul style="list-style-type: none"> Amount of material flow: TUD / ILK Input data SimaPro®

- initial identification using available data (SimaPro® databases)
- disregarding CO₂-absorptions (production phase)



- Initial data vs. specific data (New arrangement of flows and process steps in SimaPro)
- Preview: Decision support tool
- Outlook: Integrating Social aspects?
Manpower (wood profile) vs. energy consumption (steel)



Thank you for your attention!

For more questions: www.tu-dresden.de/wwbwlbu/en

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Technische Universität Dresden is validated according to EMAS regulations since January 2003, successful revalidation in December 2006.

Information: <http://www.tu-dresden.de/umwelt/english.htm>



cross section A-A

