Appendix A-5

Generic values for Transports (TR) along the Chain of Custody (CoC) Of (mainly) national production (EP) within the EU

For selected product groups
as Transportdistance (km)
and CO2-Emissisons in kg CO2-äq
short key: EP^{TR}-EU

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Appendix 5 / Generic values for Transports (TR) along the Chain of Custody (CoC) of (mainly) national production (EP) within the EU in comparison with LCT-limits..

content:	Generic values for Transports (TR) along the Chain of Custody (CoC) of (mainly) national production (EP) within the EU
scope:	Europäische Union
Data typ	generic.
Short key:	EU^{TR}-EU
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Definitions

Definition:	The EP-TR-EU value is based on the transport kilometres in the chain of custody of national domestic production (EP) in Europe or within Europe (EU). The value expresses how many kilometres are driven generically "cradle to gate" for the provision of raw materials, semi-finished goods and intermediate products if all manufacturers along the chain have their production sites in a country of the European Union. In this approach, no imports into the European Union are modelled. Thus, the share of own production is simulated under the assumption of purely domestic material flows. This certainly underestimates the real flows of goods behind product-related supply chains, since imports also occur in almost all production steps.

purpose

The generic values compiled here for transports along the supply chains for the manufacture of different wood products serve as a reference for estimating the climate protection effect of reduced transports along supply chains, as can be demonstrated with a Holz von Hier® certification.

In the tables for the respective products, the assumed generic transport distances (and the associated CO2 emissions) are therefore compared with the upper limits, i.e. maximum distances, on which Holz von Hier® is based.

Notes and explanations on derivation

The determination of the generic average distances for transports along the supply chain (Ø EP-EUTR generic EU averages based on experience) is partly based on an analysis of existing assessments and studies. Above all, however, it takes into account empirical values that the authors have gained from discussions with the relevant actors in an effort to build regional supply chains (only if it needs to be proven where the material comes from do the true transport routes become clearer). Such statements from practice are extremely important, since the real routes for the procurement of materials and raw materials cannot be determined from a pure structural analysis (i.e.: what is the density of certain producers and what is the average minimum distance of a potential customer to the next producer). In practice, it is by no means

the case that a company / customer always obtains the material from the nearest producer or supplier! In practice, the material is often sourced from a much greater distance. The reasons for this can be manifold: price structure, delivery conditions, business relations, assortments, quality issues and others.

An evaluation of life cycle assessments and environmental product declarations is also unusable as a source of reference, since EPDs are usually calculated with standard data sets that significantly underestimate the true transports. The information provided by the companies on the distances to be covered is usually not reliable, as there is a tendency and motivation to correct the values downwards or to assume that short sources of supply are 'usual'.

In the product-related tables, the respective individual steps of the transports along the supply chain are indicated as well as the respective accumulated sum of the transport distances.

In comparison to the generic average values, valid upper limits for the transport distances per product are given for Holz von Hier®. The resulting accumulated transport limits therefore represent the maximum transport distances and associated CO2 emissions that can occur for a certified product. The real accumulated transport distances for Holz von Hier® are generally always well below these upper limits. However, they only become apparent in the case of a concrete, delivered product. The CO2 savings of Holz von Hier® compared to the generic benchmark value are therefore generally higher for concrete products than would result mathematically from the difference in the tables.

Definitions.

Cradle: This refers to the starting point of the transports at the raw material, i.e. roundwood in this case.

Gate: This refers to the factory gate of the respective node/producer..

The products can then be transported from "gate", either (1) directly from the last manufacturer (gate) to the customer (customer) or to the construction site (gate-to-customer). (2) They can also be transported from the manufacturer (gate) via the trade (market) to the customer (gate-to-trade-to-customer). These transport distances (under 2) are not yet included here.

Abkürzungen

CtC = cradle-to-customer
CtG = cradle-to-gate
FE = window unit
FW = veneer producer
GtC = gate-to-customer
GtM = gate-to-market
HS = wood chips
i.VK = inklusive preliminary value chains
LH = deciduous
mtc = market-t-o-customer
NH = coniferous
NH/LH = coniferous 50% and deciduous 50%
o.VK = without prechains
P = Producer
REST = residues
RH = round wood
SH = sawn wood
SW = Saw mill
VK = pre chains

Emission factors (PROBAS Datenbank)

Factor: CO_2 in [kg CO_2/t] (km * Factor: 0,054 kg CO_2/t for Lorry)

Factor: CO_2 in [kg CO_2/t] (km * Factor: 0,135 kg CO_2/t for small lorries)

Factor: CO_2 in [kg CO_2/t] (km * Factor: 0,039 kg CO_2/t for river shipping)

(Vor-)Produkte aus Rundholz (Tab. 1)

The table compiles the transport distances that occur along the supply chain in the manufacture of preliminary products or products from roundwood. This means here the transports of roundwood to the respective manufacturer.

Short key	Input materials into production	Description	Ø EP-EU^{TR} Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
Schittholz gesamt NH/LH-SH	NH/LH-RH 50%/50%	NH/LH Rundholz aus Wald an SW Mittelwert	400 km	21,6	175 km	9,5
Nadel-Schnittholz NH-SH	NH-RH 100 %	NH-RH (div NH) aus Wald an SW	250 km	13,5	100 km (75 – 150)	5,4
Laub-Schnittholz LH-SH	LH-RH 100 %	LH-RH aus Wald an SW	550 km	29,7	250 km	13,5
Furnier	FH-RH: 100 %	NH/LH Rundholz aus Wald an FW	700 km	37,8	175 km	9,5
RH-Span-Platte-P RH-OSB-Platte-P RH-Faser-Platte-P	RH: 100 %	RH Wald an Span-/OSB-/Faser-Platten Produzent (P)	400 km	21,6	150 km	8,1
RH-Sperrholz-P RH-Furnier-Sperrh-P	RH: 100 %	RH Wald an Sperrholz-/Furnier-Sperrholz-Platten-P	700 km	37,8	250 km	13,5
RH-Parkett-P	RH: 100 %	RH aus Wald an Parkett-P	400 km	21,6	250 km	13,5
RH-Kantel-P	RH: 100 %	RH aus Wald an Kantel-P	400 km	21,6	150 km	8,1
RH-Zellstoff-P	RH: 100 %	RH aus Wald zu Zellstoff-P	400 km	21,6	150 km	8,1
RH(ges)-SW/Hack-P	RH: 100 %	NH/LH-RH aus Wald zu SW	400 km	21,6	150 km	8,1
RH(NH)-SW/Hack-P	RH: 100 %	NH-RH aus Wald zum SW	250 km	13,5	100 km	5,4
RH(LH)-SW/Hack-P	RH: 100 %	LH-RH aus Wald zum SW	550 km	29,7	250 km	13,5

Remarks:

Hardwood logs are usually transported much further than softwood logs. On the one hand, this is because different types of roundwood occur in smaller proportions in the forest than softwood and are therefore less densely distributed. On the other hand, because higher quality requirements are often made here, especially for saw logs.

Particularly high demands are made on veneer raw material. The roundwood for this is usually purchased through tenders, to which interested parties come from far away.

For mixed assortments (NH + LH), the value is the average of both transport distances.

High distances for parquet and window scantlings result from higher quality demands. High distances for pulp and board materials result from the large catchment area of the few large manufacturers.

Sawn wood to processor (Tab. 2)

The table compiles transport distances that occur in connection with the further processing of sawn timber into other products along the supply chain.

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
SH-Leimholz-P-(o.VK)	SH: 100%	NH-SH zum Produzenten von KVH, BSH, CLT	400 km	21,6	150 km	8,1
SH-Leimholz-P-(i.VK)	SH: 100%	NH-SH zum Produzenten (P) von KVH, BSH, CLT inklusive Vorketten mit RH zu SW (400 km)	650 km (250+400)	35,1	250 km (100+150)	13,5
SH-Parkett-P-(o.VK)	SH: 100%	NH/LH-SH zu Produzenten (P) von Parkett	400 km	21,6	175 km	9,5
SH-Parkett-P-(i.VK)	RH - SH	NH/LH-SH zu (P) von Parkett (400 km) inkl. Vorketten (VK) mit RH zu SW (400 km)	800 km (400+400)	43,2	275 km (100+175)	14,9
SH-FE-Kantel-P-(o.VK)	SH: 100%	NH/LH-SH zu Kantelherstellung (s. Tab. 1)	400 km	21,6	175 km	9,5
SH-FE-Kantel-P-(i.VK)	RH - SH	NH/LH-SH zur Kantelherstellung (400 km) inkl. Vorkette mit RH zu SW (400 km)	800 km (400+400)	43,2	275 km (100+175)	14,9

Notes on the average values:
High distances for parquet and window scantlings result from higher quality requirements for the roundwood.

Residues to processing (Tab. 3)

Die Tabelle stellt Transportentfernungen zusammen, die im Zusammenhang mit der Weiterverarbeitung von Sägerestholz zu anderen Produkten entlang der Lieferkette anfallen.

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
HS-Zellstoff-P-(o.VK.)	HS: 100%	Hackschnitzel (NH/LH) von SW an Zellstoff Produzent (P)	500 km	27,0	200 km	10,8
HS-Zellstoff-P-(i.VK.)	HS: 100%	HS (NH/LH) von SW an Zellstoff-P (500 km) i.VK RH an SW (400 km)	900 km (400+500)	48,6	350 km (150+200)	18,9
REST-Platte-P-(o.VK.)	Rest: 100%	Rest SW zu Platten-P	500 km	27,0	200 km	10,8
REST-Platte-P-(i.VK.)	Rest: 100%	Rest-SW zu Platten-P i.VK RH zu Platten-P (400 km)	900 km (400+500)	48,6	350 km (150+200)	18,9
REST-Pellets-P-(o.VK)	Rest: 100%	Rest SW zu Pellets-P	500 km	32,4	200 km	10,8
REST-Pellets-P-(i.VK)	Rest: 100%	Rest-SW zu Pellets-P i.VK mit RH an Pellets-P (400 km)	900 km (400+500)	54,0	350 km (150+200)	18,9

Notes on the average values:
The long distances for wood chips and sawmill residue in the supply of pulp, board and energy wood producers are based on the fact that procurement is increasingly taking place via traders who purchase and bundle everywhere in Germany and in turn supply the various producers in Germany.

Constructional timber (Tab. 4)

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
Supply chain classical construction timber						
CtG-Bauholz	NH-RH	Nadelrundholz an Sägewerk	250 km	13,5	100 km (75 – 150)	5,4
GtC-Bauholz	Bauholz im Objekt	Bauholz an Baustelle/Customer	300 km	16,2	150 km	8,1
Lieferkette: (I) Klassisches Bauholz			550 km	29,7	250 km	13,5
Supply chain planed softwood						
CtG-Hobelware	NH-RH	Nadelrundholz an HW	250 km	13,5	100 km (75 – 150)	5,4
GtC-Hobelware-iVK-im-Objekt	Hobelware im Objekt	Hobelware an Baustelle/Customer	500 km	27,0	200 km	10,8
Lieferkette: (II) Hobelware Nadelholz			750 km	40,5	300 km	16,2
Supply chain glue laminated wood						
CtG-KVH/BSH	NH-RH	Nadelrundholz an Sägewerk das KVH/BSH selbst produziert	250 km	13,5	100 km (75 – 150)	5,4
GtC-KVH/BSH-im-Objekt	KVH/BSH im Objekt	KVH, BSH an Baustelle/Customer	600 km	32,4	300 km	16,2
Lieferkette: (I) CtC-KVH, CtC-BSH			850 km	45,9	400 km	21,6
CtG-NH-RH	NH-RH	Nadelrundholz aus Wald an Sägewerk	250 km	13,5	100 km (75 – 150)	5,4
CtG-NSH	NSH	Nadelschnittholz an KVH/BSH Produzent	400 km	21,6	150 km	8,1
CtG-KVH/BSH-iVK	NSH	NSH an KVH/BSH Produzent (i.VK)	650 km	35,1	250 km (100+150)	13,5
GtC-KVH/BSH	KVH/BSH im Objekt	KVH, BSH an Baustelle/Customer	600 km	32,4	300 km	16,2
Lieferkette: (II) CtC-KVH, CtC-BSH			1.250 km	67,5	550 km	29,7

Notes on the average values:
Classic (listed) construction timber is almost no longer used outside of emphatically regional supply chains. These assortments are now predominantly replaced by engineering timber (see below).

Since softwood planed products usually have to meet somewhat higher quality requirements than softwood lumber or classic construction timber, the transport distances for planed products are set at 500 km, which is somewhat higher than for the latter assortments.

Manufacturers of engineered wood products are thinner than e.g. planing mills and especially than sawmills. This is the reason for the higher average distances for engineered wood products than for construction timber or planed goods.

Veneer and deciduous sawn wood for furnitures (Tab. 5)

Short key	Input materials into production	Description	Ø EP-EU^{TR} Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
Supply chain veneer						
CtG-Furnier	NH/LH-RH	NH/LH Rundholz an Furnierwerk (s. Tab. 1)	700 km	37,4	175 km	9,5
GtM-Furnier	Furnier	Furnier auf dem Markt oder an nächsten Knotenpunkt (Möbel)	600 km	32,4	350 km	18,9
Lieferkette: CtM Furniere			1.300 km	69,8	425 km	28,4
Supply chain planed hardwood						
CtG-Hobelware LH	LH-RH	Laubrundholz an Sägewerk	550 km	29,7	225 km	12,2
GtM LH-Hobelware	Hobelware LH	Hobelware auf dem Markt oder zum nächsten Weiterverarbeiter oder zur Baustelle	500 km	27,0	250 km	13,5
Lieferkette: CtC Laubholz Hobelware			1.050 km	56,7	475 km	25,7

Notes on the average values:
There are only a few veneer manufacturers left in Germany. They are also heavily concentrated in central Germany, so that long distances prevail, especially in sales.

boards (Tab. 6)

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-NSH	NH-RH	NH-RH aus Wald zum SW	250 km	13,5	100 km	5,4
CtG-Massivpl.	NSH	NH-SH zu NH-Massivpl.	400 km	21,6	150 km	8,1
GtM-Massivplatten	Massivpl.	Massivholzpl. auf den Markt oder an Weiterverarbeiter	700 km	37,8	350 km	18,9
Supply chain: CtC-solid wood panel softwood			1.350 km	72,9	550 km	29,7
CtG-LSH	LH-RH	LH-RH aus Wald zum SW	550 km	29,7	225 km (200-250)	12,1
CtG-Massivpl.	LSH	LH-SH zu LH-Massivpl.	550 km	29,7	250 km	13,5
GtM-Massivplatten	Massivpl.	Massivholzpl. auf den Markt oder an Weiterverarbeiter	800 km	43,2	350 km	18,9
Supply chain: CtC-solid wood panel hardwood			1.900 km	102,6	825 km	44,5
CtG-Spanplatten	RH: 20% REST: 80% (*) (*) Holzreste aus Sägewerken und industrieller Produktion	RH: 400 km; RH: 21,6 kgCO_2/t (s. Tab. 1) REST-iVK: 900 km (400+500) (s. Tab. 3) Rest-iVK; REST- iVK: 48,60 kg CO_2/t RH: 20% / REST: 80% Berechnung: [(21,60 * 0,2 = 4,32) + (48,60 * 0,8 = 38,88)] = (4,32 + 38,88) = CO_2: 43,20 kg CO_2/t; Km: 800 km	800 km	43,2	190 km (150 * 0,2 + 200 * 0,8)	10,3
GtM-Spanplatten	Spanplatten	Spanplatten auf dem Markt oder zum nächsten Weiterverarbeiter oder zur Baustelle	700 km	37,8	350 km	18,9
Supply chain: CtC- particle boards			1.500 km	81,0	540 km	29,2
CtG OSB-Platten	RH: 30% REST: 70%	RH: 400 km; RH: 21,6 kg CO_2/t (s. Tab. 1) REST-iVK: 900 km (400+500) (s. Tab. 3) REST-iVK: 48,60 kgCO_2/t RH: 50% / REST: 50% Berechnung: [(21,60 * 0,3 = 6,48) + (48,60 * 0,7 = 34,02)] = (6,48 + 34,02) = CO_2: 40,50 kg CO_2/t; km ber.: 750 km	750 km	40,5	185 km (150 * 0,3 + 200 * 0,7)	10,0
GtM/GtC OSB-Platten	OSB-Platten	OSB-Platten auf dem Markt oder zum nächsten Weiterverarbeiter oder zur Baustelle	700 km	37,8	350 km	18,9
Supply chain: CtC-OSB-board			1.450 km	78,3	500 km	28,9

Notes on the average values:
There are only a handful of solid wood, particle board and OSB manufacturers in Germany. Therefore, the transport distances are of the same order of magnitude as for veneer.

CtG Faserplatten	RH: 20% REST: 80%	RH: 400 km; RH: 21,6 kgCO_2/t (s. Tab. 1) REST-iVK: 900 km (400+500) (s. Tab. 3) Rest-iVK; REST- iVK: 48,60 kg CO_2/t RH: 20% / REST: 80% Berechnung: [(21,60 * 0,2 = 4,32) + (48,60 * 0,8 = 38,88)] = (4,32 + 38,88) = CO_2: 43,20 kg CO_2/t; Km: 800 km	**800 km**	**43,2**	**190 km (150 * 0,2 + 200 * 0,8)**	**10,3**
GtM/GtC Faser-Platten	Faser-Platten	Faser-Platten auf dem Markt oder zum nächsten Weiter-verarbeiter oder zur Baustelle	**800 km**	**43,2**	**350 km**	**18,9**
Supply chain: CtC-fibre board (MDF/HDF)			**1.600 km**	**86,4**	**540 km**	**29,2**

CtG (Furnier-)Sperrholz-Platten	100% RH zur Sperrholzher-stell.	NH-RH / LH-RH aus Wald zum Sperrholzhersteller (s. Tab. 1)	**700 km**	**37,8**	-	
GtM/GtC Sper-rholz-Platten	Sperrholz-Platten	Sperrholz-Platten auf dem Markt, zum nächsten Weiter-verarb. oder Baustelle	**800 km**	**43,2**	-	
Supply chain: CtC-plywood			**1.500 km**	**81,0**	-	

Notes on the average values:
Fibreboard and plywood manufacturers are each only a handful left in Germany. Therefore, the transport distances are of the same order of magnitude as for veneer.

windows (Tab. 7)

supply chain window scantles

Short key	Input materials into production	Description	Ø EP-EU^{TR} Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-NSH	NH-RH	Nadelrundholz an Sägewerk – Herstellung Schnittholz (SH)	250 km	13,5	100 km	5,4
CtG-Kanteln NH	NH-SH	NH-Schnittholz zu Kantelproduzent	500 km	27,0	150 km	8,1
Supply chain: CtG-scantles softwood			750 km	40,5	250 km	13,5
CtG-LSH	LH-RH	Laubrundholz an Sägewerk – Herstellung Schnittholz (SH)	550 km	29,7	200 km	10,8
CtG-Kanteln LH	LH-SH	LH-Schnittholz zu Kantelproduzent	500 km	27,0	250 km	13,5
Supply chain: CtG-scantles hardwood			1.050 km	56,7	450 km	24,3

Supply chain windows

Short key	Input materials into production	Description	Ø EP-EU^{TR} Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
NH-Kanteln-iVK	Kanteln-NH	Herstellung Kanteln inkl VK	750 km	40,5	250 km	13,5
CtG-FE-Rahmen	FE-Rahmen	Kantelholz an Hersteller von-FE-Rahmen	800 km	43,2	350 km	18,9
GtC-NH-Fenster	Fenster (FE)	Fenster Baustelle/Customer[1]	500 km	67,5	350 km	47,3
Supply chain: CtG-windows softwood			2.050 km		950 km	79,7
LH-Kanteln-iVK	Kanteln-LH	Herstellung Kanteln inkl VK	1.050 km	56,7	450 km	24,3
CtG-FE-Rahmen	FE-Rahmen	Kantelholz an Hersteller von-FE-Rahmen	800 km	43,2	350 km	18,9
GtC-LH-Fenster	Fenster (FE)	Fenster Baustelle/ Customer[1]	500 km	67,5	350 km	47,3
Supply chain: CtGwindows hardwood			2.350 km	171,4	1.150 km	90,5

Notes on the average values:
The production of windows is now almost predominantly done by purchasing scantlings as a pre-product. However, there are only a handful of manufacturers of scantlings in the whole of Germany. Therefore, 800 km are used here.

[1] Ansatz Transport mit Klein-LKW

Furnitures (Tab. 8)

Supply chains furnitures

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-Massivplatten NH i.VK	Massivholzplatten	(1) NH-RH an SW- Herstellung Schnittholz (SH); (2) Schnittholz zu Hobelware; (3) Hobelware zu Massivplattenhersteller; (4) Massivholzplatten zum Möbel-Hersteller (Tab. 6)	1.350 km	72,9	550 km	29,7
MtC-Möbel	Möbel NH	Vollholzmöbel zu Kunde / Möbelhaus	500 km	27,0	200 km	10,8
Supply chain: CtC-furnitures from solid wood panels softwood			1.850 km	99,9	750 km	40,5
CtG-Massivplatten LH i.VK	Massivholzplatten	(1) LH-RH an SW- Herstellung Schnittholz (SH); (2) Schnittholz zu Hobelware; (3) Hobelware zu Massivplattenhersteller; (4) Massivholzplatten zum Möbel-Hersteller (Tab. 6)	1.900 km	102,6	825 km	44,5
MtC-Möbel	Möbel LH	Vollholzmöbel zu Kunde / Möbelhaus	500 km	27,0	200 km	10,8
Supply chain: CtC-furnitures from solid wood panels hardwood			2.400 km	129,6	1.025 km	55,3
CtG Spanplatten i.VK	RH: 30% REST: 70% (*)	Berechnung Spanplatten siehe Tab. 6	1.500 km	81,0	540 km	29,2
mtc Spanpl.möbel	Möbel	Spanpl.möbel zu Kunde / Möbelhaus	500 km	27,0	200 km	10,8
Supply chain: CtC-furnitures from particle board			2.000 km	109,0	740 km	40,0
CtG (Furnier-) Sperrholz-Platten	RH zu Sperrholz	Berechnung siehe Sperrholzplatten (Tab. 6)	1.500 km	81,0	-	-
MtC (Furnier-) Sperrholzmöbel	Möbel	Sperrholzmöbel zum Kunden / Möbelhaus	500 km	27,0	-	-
Supply chain: CtC-furnitures from plywood			2.000 km	109,0	-	-

Notes on the average values:
Veneer plywood is not yet available under Wood from Here, so no comparison here.
The transport distances of the furniture to the customer is calculated here on the basis of furniture shops or furniture shops, as this is the usual purchase. Individual furniture from a carpenter would probably have shorter transport distances.

floors (Tab. 9)

supply chains floors

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
RH-Parkett-P	RH: 100%	RH aus Wald an Parkettwerk	400 km	21,6	250 km	13,5
SH-Parkett-P-(i.VK)	SH: 100%	NH/LH-SH zu Parkettwerk (400 km) inkl. Vorketten (VK) mit RH zu SW (400 km)	800 km (400+400)	43,2	275 km (100+175)	14,9
CtG-Parkett	RH: 50% SH: 50%	Bsp. generisch: RH-MW: 400 km; RH-MW: 21,6 kgCO_2/t; SH-iVK: 800 km; 43,20 kgCO_2/t; RH: 50% / REST: 50%; Ber: [(21,60 * 0,5 = 10,80) + (43,20 * 0,5 = 21,60)] = (10,80 + 21,60) = 32,40 kg CO_2/t; 600 km	600 km	32,4	263 km	14,2
GtC-Parkett	Parkett	Parkett an Customer/Handel	700 km	37,8	300 km	16,2
Supply chain: CtC-Parquet Mix (RH/SH)			1.100 km	70,2	563 km	30,4

Lieferketten Böden –Dielen

CtG-Dielen NH	NH-RH	NH-RH an Dielen-Hersteller	250 km	13,5	100 km	5,4
GtC-Dielen NH	Dielen	Dielen an Customer/Handel	500 km	27,0	300 km	16,2
Supply chain: CtC-planks softwood			750 km	40,5	400 km	21,6

CtG-Dielen LH	LH-RH	LH-RH an Dielenhersteller	550 km	29,7	225 km	12,2
GtC-Dielen LH	Dielen	Dielen an Customer/Handel	500 km	27,0	300 km	16,2
Supply chain: CtC-planks hardwood)			1.050 km	56,7	525 km	28,4

CtG-Dielen mix	NH/LH-RH	NH/LH-RH an Dielenhersteller	400 km	21,6	163 km	8,8
GtC-Dielen Mix	Dielen	Dielen an Customer/Handel	500 km	27,0	300 km	16,2
Supply chain: CtC-planks mix			900 km	48,6	463 km	25,0

Notes on the average values:
There are only a few parquet factories that mainly supply the trade. Therefore, significantly longer transport distances are used here than, for example, for furniture with a significantly denser distribution of the furniture industry.

Floorboards are mostly produced by specialised sawmills, which are more densely distributed than parquet manufacturers.

pulp (Tab. 10)

supply chains pulp

RH-Zell(Sa) = Rundholz für Zellstoff (Sulfat)-Herstellung

RH-Zell(Si) = Rundholz für Zellstoff (Sulfit)-Herstellung:

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-Zellstoff(Sa) Sulfat	RH-Zell(Sa): 60% Hack(NH/LH) -iVK: 40%	Bsp. gen.: RH-Zell(Sa): 400 km; 21,6 kgCO_2/t. Hack-iVK: 900 km; 48,60 kgCO_2/t (RH an SW 400 km, Hack von SW an Zellstoff-P: 500 km, sum 900 km) Ber.: [(21,60 * 0,6 = 12,96) + (48,60 * 0,4 = 19,44)] = (12,96 + 19,44) = 32,40 kg CO_2/t	**600 km**	**32,4**	**230 km (150*0,6+ 350*0,4)**	**12,4**
GtC-Zellstoff(Sa)	Zellstoff an Weiterverarbeiter	Zellstoff(Sa): Davon 50% mit Binnenschiff und 50% mit LKW-Sattelzug. Zellstoff(Sa)-Ber.: [(1.000 km * Faktor LKW = 54,0 kg CO_2/t) + (1.000 km *Faktor Binnenschiff = 39,0 kg CO_2/t] = [(54+39)/ 2] = 46,5 kg CO_2/t	**1.000 km**	**46,5**	**500 km**	**23,3**
Supply chain: CtC-pulp(Sa)-iVK			**1.600 km**	**78,9**	**730 km**	**35,7**
CtG-Zellstoff(Si) Sulfit	RH-Zell(Si): 70% Hack(NH/LH) -iVK: 30%	RH-Zell(Si): 400 km; RH-Zell(Si): 21,6 kgCO_2/t Hack-iVK: 900 km; 48,60 kgCO_2/t (RH an SW 400 km, Hack von SW an Zellstoff-P: 500 km, sum 900 km) Ber.: [(21,60 * 0,7 = 15,12) + (48,60 * 0,3 = 14,58)] = (15,12 + 14,58) = 29,70 kg CO_2/t	**550 km**	**29,7**	**210 km (150*0,7+ 350*0,3)**	**11,3**
GtC-Zellstoff(Si)	Zellstoff an Weiterverarbeiter	Zellstoff(Sa): Davon 50% mit Binnenschiff und 50% mit LKW-Sattelzug. Zellstoff(Sa)-Ber.: [(1.000 km * Faktor LKW = 54,0 kg CO_2/t) + (1.000 km *Faktor Binnenschiff = 39,0 kg CO_2/t] = [(54+39)/ 2] = 46,5 kg CO_2/t	**1.000 km**	**46,5**	**500 km**	**23,3**
Supply chain: CtC-pulp(Si)-iVK			**1.550 km**	**76,2**	**710 km**	**34,6**

Notes on the average values:

Pulp producers are very few in Europe. There are only two in Germany and four in Austria.
Therefore, 1,000 km are used. Furthermore, 50% inland waterway transport is assumed. This may underestimate the emissions, as it is questionable whether ships are used for continental deliveries from within Europe. This is more likely to be the case for non-European transport.

Paper production (Tab. 11)

Supply chains paper

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-Graphische-Papiere	Zellstoff-Sa: 20% Zellstoff-Si: 80%	s. Tab. 10. Berechnung Zell (Sa+Si) gener.: [(78,9 * 0,2 = 15,8) + (76,2 * 0,80 = 61,0)] = 76,8 kg CO_2/t	**1.600 km**	**76,8**	**720 km**	**34,8**
GtC-Graphisches-Papier	Graphisches Papier zum Markt	Auslieferung vom Produzenten per LKW-Sattelzug.	**1.000 km**	**54,0**	**500 km**	**27,0**
Supply chain: CtC-Grafic paper-iVK			**2.600 km**	**130,8**	**1.220 km**	**61,8**
CtG-Hygiene-papier	Zellstoff-Sa: 40% Zellstoff-Si: 60%	s. Tab. 10. Berechnung Zell (Sa+Si) gener.: [(78,9 * 0,4 = 31,6) + (76,2 * 0,6 = 45,7)] = 77,3 kg CO_2/t	**1.600 km**	**77,3**	**720 km**	**35,1**
GtC- Hygiene-papier	Hygiene-Papier zum Markt	Auslieferung vom Produzenten per LKW-Sattelzug.	**1.000 km**	**54,0**	**500 km**	**27,0**
Supply chain: CtC-hygienic paper-iVK			**2.600 km**	**131,3**	**1.220 km**	**62,1**

Notes on the average values:
Although there are a comparatively large number of paper producers, they are each very specialised. For example, there are only a few producers of graphic papers. The market for sanitary paper is also dominated by a few players. Therefore, an average transport distance of 1,000 km is assumed for the paper from the mill to the market (usually trade).
Therefore, 1,000 km are assumed.

Print products (Tab. 12)

Lieferketten Druckprodukte

CtG-Drucke (ges) Druck im Druckhaus (cradle to gate)

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-Drucke	Graph. Papiere (100%)	CtC-Graphisches-Papier-iVK: s. Tab. 11	**2.600 km**	**130,8**	**1.220 km**	**61,8**
GtC-Drucke	Drucke zum Kunden	Angesetzt werden hier 500 km mit Klein-LKW(*) (Faktor: 0,135 kg CO_2/t)	**500 km**	**67,5**	**200 km**	**27,0**
Supply chain: CtC-printed products-iVK			**3.100 km**	**198,3**	**1.420 km**	**88,8**

Fuel wood (Tab. 13)

Supply chains wood chips

Short key	Input materials into production	Description	Ø EP-EU[TR] Generice Values EU		HVH limit	
			km	[kg CO2/t]	km	[kg CO2/t]
CtG-Hacksch.-ges	RH-NH/LH: (50%/50%)	RH-Hack(NH/LH): 400 km (s. Tab. 1)	**400 km**	**21,60**	**150 km**	**8,1**
GtC-Hacksch.-ges	Hackschnitzel an Kunde	Angesetzt werden hier 500 km mit LKW-Sattelzug	**500 km**	**27,0**	**250 km**	**13,5**
Supply chain: CtC-wood chips mix-iVK			**900 km**	**ca. 49**	**400 km**	**21,6**
CtG-Hacksch.-NH	RH-NH: 100%	RH-Hack(NH): 250 km	**250 km**	**13,50**	**100 km**	**5,4**
GtC-Hacksch.-NH	Hackschnitzel an Kunde	Angesetzt werden hier 500 km mit LKW-Sattelzug	**500 km**	**27,0**	**250 km**	**13,5**
Supply chain: CtC-wood chips softwood-iVK			**750 km**	**ca. 41**	**350 km**	**18,9**
CtG-Hacksch.-LH	RH-LH Ei/Bu	RH-Hack(LH): 550 km	**550 km**	**29,70**	**250 km**	**13,5**
GtC-Hacksch.-LH	Hackschnitzel an Kunde	Angesetzt werden hier 500 km mit LKW-Sattelzug	**500 km**	**27,0**	**250 km**	**13,5**
Supply chain: CtC-wood chips hardwood-iVK			**1.050 km**	**ca. 57**	**500 km**	**27,0**

Supply chains pellets

CtG-Holz-Pellets	Rest: 100%	REST-iVK: 400 km = 21,60 kg CO_2/t; REST: Rest an Pelletsh.: 600 km = 32,4 kg CO_2/t; Pellets-iVK: 21,60 + 32,40 = 54,00 kg CO_2/t	**1000 km**	**54,00**	**350 km (150+200)**	**18,9**
GtC-Holz-Pellets	Holz-Pellets an Kunde	Angesetzt werden hier 500 km mit Klein-LKW (Faktor: 0,135 kg CO_2/t)	**500 km**	**67,5**	**300 km**	**40,5**
Supply chain: CtC-pellets-iVK			**1.500 km**	**121,5**	**650 km**	**59,4**