



**Hapag-Lloyd**

**The value added to our existing information**



# Carbon Calculation - Ocean



## Carbon Emission Calculation – dry and reefer shipments

### Calculations are based on

- methodology developed by CCWG
- for own/charter vessels
- for dry and reefer shipments
- weighted average of all vessels on a trade lane

= **Trade lane emission factor/TEU-km**

- Number of TEU
- Distance between port-pairs

= **Individual Carbon Footprint**



# Emission Calculation - Transport Chain



## Emission/Carbon calculation for whole door-to-door transport chain



# Emission Calculation - Transport Chain



## Emission/Carbon calculation for whole door-to-door transport chain

### Research Activities

- Analysis of commercial software products
- Carbon Accounting tools



### Specific requirements of global transport chain

- Includes all transport modes
- Geographical data
- Carbon and other emissions



# EcoCalc Implementation



**EcoCalc is embedded as an iframe**



**Hapag-Lloyd's emission calculation server hosted by IVE**

## Usability

- Type ahead function for the location search supporting UN location codes
- Multilingual user interface – 4 languages supported (English, German, Spanish and Chinese)
- Result on one page and downloadable as PDF
- Keep it simple - only 3-5 information entries needed for a calculation

## Added value

- In addition to CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>10</sub> are calculated using the EcoTransIT methods
- Pre- and on-carriage could be included to cover door-to-door transport chain

## Reliability of calculation

- Routing selection based on Hapag-Lloyd's location catalogue
- For pre- and on-carriage all emissions displayed for CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>10</sub> are calculated according to the EcoTransIT methods
- CO<sub>2</sub> of seaborne transportation calculated according to CCWG and data has been verified by Germanischer Lloyd

# Emission Calculation - Transport Chain



## EcoCalc launched in October 2011

**Hapag-Lloyd** Sustainability

Company: About us, Press, IR, Career, Fleet, Products & Services, Offices, Local Info, News, Online Business  
 Business: Overview, Management, Philosophy, Sustainability, Our Awards, Foundation, History  
 Quality & Environment: EcoCalc, At a glance, Vessel Technology, On Board, Container, Shore-Based Contribution, Policy, Certificates

**EcoCalc**  
 The Hapag-Lloyd EcoCalc allows you to calculate the emissions of your container transport from the beginning to the end of its journey. We offer a comprehensive overview of various types of emissions, covering:

- > Carbon Dioxide (CO<sub>2</sub>)
- > Nitrogen Oxide (NO<sub>x</sub>)
- > Sulphur Dioxide (SO<sub>2</sub>)
- > Particulate Matter (PM<sub>10</sub>)

Please fill in the following details. The boxes marked with an \* are mandatory in order to calculate your emissions.

Start of Transport: NAPA, CA, USA (USAPC)  
 Port of Loading\*: OAKLAND, CA, UNITED STATES (USOAK)  
 Port of Discharge\*: HAMBURG, GERMANY (DEHAM)  
 End of Transport: UELZEN, GERMANY (DEUEL)  
 Cargo Volume\*: 10 TEU

**Calculate**

**FAQ EcoCalc**  
 Here you find frequently asked questions regarding the Hapag-Lloyd EcoCalc.  
**Contact**  
 For further questions regarding the EcoCalc, please read our FAQ or contact us via Email.  
 You may of course also contact your local sales person in case of questions.  
**Verification Statement**  
 Hapag-Lloyd emission data verified by Germanischer Lloyd.  
**Driven by responsibility**  
 Please read our newly published environmental brochure "Driven by responsibility".

**Hapag-Lloyd EcoCalc Methodology**  
 The Hapag-Lloyd EcoCalc considers the different sections of the transport chain and applies industry recognised methods of calculation.  
 For seaborne transportation, emissions of carbon dioxide are calculated according to the methodology developed by the Clean Cargo Working Group. Hapag-Lloyd provides the basic calculation data for all owned container vessels and vessels operated under long-term charter. Nitrogen oxide, sulphur dioxide and particulate matter emissions are calculated according to the methods of EcoTransIT World.  
 For pre- and on-carriage all emissions displayed for CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>10</sub> are likewise calculated according to the EcoTransIT World methods.  
 For all transport modes full utilization of capacities is assumed.

From	To	Mode of transport	Distance in km	CO <sub>2</sub> in kg	NO <sub>x</sub> in kg	SO <sub>2</sub> in kg	PM <sub>10</sub> in kg
NAPA, CA, USA (USAPC)	OAKLAND, CA, UNITED STATES (USOAK)	Truck	68	571.07	2.92	0.69	0.21
OAKLAND, CA, UNITED STATES (USOAK)	HAMBURG, GERMANY (DEHAM)	Vessel	15,512	11,479.19	483.05	290.00	42.66
HAMBURG, GERMANY (DEHAM)	UELZEN, GERMANY (DEUEL)	Truck	95	550.70	4.38	0.67	0.12
<b>Total:</b>			<b>15,675</b>	<b>12,600.96</b>	<b>490.35</b>	<b>291.36</b>	<b>42.99</b>

**Download Your EcoCalc Result**  
 The emissions calculated are average arithmetical values for a standard container based on a variety of theoretical factors. Depending on input data emissions and actual route taken during shipment may diverge from these average arithmetical values.  
 No liability is accepted for the completeness and accuracy of these calculations.

by Germanischer Lloyd.  
**Driven by responsibility**  
 Please read our newly published environmental brochure "Driven by responsibility".  
**DRIVEN BY RESPONSIBILITY**  
 Publications  
**Environmental Protection on Board our Ships**  
 Please click to enlarge the image.

With the Hapag-Lloyd online emission calculator not only CO<sub>2</sub> but also SO<sub>2</sub>, NO<sub>x</sub> and PM emissions can be estimated

# Emission Calculation - Transport Chain



## Example: Customer-specific Information

Total Transport Chain				TEUs	Total Emissions					Pre-Carriage					Main Carriage					On-Carriage				
Pre-Carriage	Main Carriage (Ocean)		On-Carriage		CO2 [kg]	NOX [kg]	SO2 [kg]	Particulates		Distance [km]	CO2 [kg]	NOX [kg]	SO2 [kg]	Particulates		Distance [km]	CO2 [kg]	NOX [kg]	SO2 [kg]	Particulates		Distance [km]		
	Origin	Port of Loading						Port of Discharge	Destin.					PM10 [kg]	Distances [km]					PM10 [kg]	Distances [km]		PM10 [kg]	Distances [km]
BRSSA	BRSSA	NLRM	NLYNR	18	11,528	491,206	265,311	41,423	8,695	36	0,377	0,045	0,008	4	12,651	468,934	265,254	41,065	8,529	1842	21,895	0,012	0,349	93
CAOAK	CAYAN	JPTYO	JPTYO	11	15,327	410,065	148,028	27,251	12,239	9,708	152,637	0,077	4,202	4,259	5,282	256,626	147,949	22,984	7,937	336	3,801	0,002	0,064	43
CASBR	CAMTR	BEANR	NLYNR	1	653	19,342	9,383	1,599	6,065	98	0,534	0,001	0,034	143	456	17,646	9,382	1,545	5,777	99	1,162	0,001	0,020	146
CATOR	CAMTR	BEANR	NLYNR	33	22,121	681,652	329,441	53,318	8,469	3,607	60,971	0,025	1,679	546	15,062	582,327	329,394	50,995	5,777	3,253	38,355	0,022	0,644	146
CATOR	CAMTR	EDUB	EDDK	22	12,613	396,843	193,142	31,252	5,711	2,538	40,647	0,017	1,119	546	8,830	341,406	193,117	29,898	5,081	1,245	14,789	0,008	0,235	83
CAYAN	CAYAN	JPTYO	JPTYO	2	1,038	47,444	26,300	4,197	7,932	17	0,094	0,000	0,006	12	960	46,659	26,300	4,179	7,937	61	0,691	0,000	0,012	43
CNSHA	CNSHA	CAYAN	CATOR	10	14,638	436,757	158,984	28,545	13,630	119	1,242	0,349	0,027	22	5,668	275,386	158,764	24,664	9,369	8,911	140,129	0,071	3,858	4,299
CNSHA	CNSHA	USLAX	USCFR	130	86,156	4,059,909	2,321,028	361,001	10,569	1,543	16,151	1,942	0,352	22	82,797	4,022,562	2,319,067	360,269	10,527	1,816	20,196	0,017	0,379	20
CNSHA	CNSHA	USLAX	USGVP	87	131,506	3,856,540	1,574,003	273,102	14,472	1,033	10,809	1,299	0,236	22	55,410	2,632,022	1,551,991	241,903	10,527	75,063	1,153,709	0,713	31,763	3,922
CNSHA	CNSHA	USLGB	USCFR	6	3,965	187,273	107,170	16,666	10,571	71	0,745	0,090	0,016	22	3,823	185,736	107,080	16,635	10,532	71	0,791	0,001	0,015	17
CNSHA	CNSHA	USSEA	USGVP	90	128,112	3,850,565	1,424,496	253,488	13,356	1,068	11,182	1,344	0,244	22	50,784	2,467,286	1,422,427	220,975	9,327	76,259	1,172,097	0,724	32,269	4,006
CNSHA	CNSHA	USSEA	USPDX	46	36,094	1,375,536	727,796	114,885	9,644	546	5,715	0,687	0,125	22	25,957	1,261,057	727,018	112,943	9,327	9,592	108,744	0,091	1,797	295
CNSHA	CNSHA	USTIW	USPDX	9	6,674	285,637	143,049	22,494	9,622	107	1,118	0,134	0,024	22	5,102	247,869	142,900	22,200	9,370	1,465	16,649	0,014	0,270	230
CNSHK	CNSHK	USTIW	USGVP	14	21,185	628,016	295,136	44,729	14,827	0	0	0	0	49	9,105	442,350	255,021	39,618	10,750	12,080	185,668	0,115	5,112	4,077
CNTAO	CNTAO	USLAX	USCFR	30	18,746	941,456	539,808	83,948	10,640	57	0,597	0,072	0,013	4	19,270	936,198	539,732	83,848	10,617	419	4,661	0,004	0,087	20
CNTAO	CNTAO	USSEA	USGVP	102	144,731	4,150,575	1,628,663	283,465	13,427	194	2,031	0,244	0,044	4	58,110	2,823,168	1,627,598	262,849	9,417	86,427	1,328,377	0,821	36,572	4,006
CNTAO	CNTAO	USSEA	USPDX	17	13,262	511,054	271,341	42,913	9,715	32	0,338	0,041	0,007	4	6,885	470,528	271,266	42,141	9,417	3,545	40,188	0,034	0,664	295
CNTAO	CNTAO	USTIW	USGVP	8	11,496	328,693	128,324	22,846	13,540	15	0,159	0,019	0,003	4	4,578	222,439	128,239	19,522	9,460	6,903	106,095	0,066	2,921	4,077
CNTXG	CNTXG	CAYAN	CATOR	16	24,244	694,792	269,404	48,000	14,262	390	4,336	0,490	0,069	49	9,597	466,251	268,800	41,758	9,914	14,258	224,206	0,113	6,173	4,299
CNTXG	CNTXG	USSEA	USDAY	1	1,452	42,046	16,767	2,954	13,802	24	0,271	0,031	0,004	49	597	29,036	16,728	2,599	9,872	830	12,759	0,008	0,351	3,881
CNTXG	CNTXG	USSEA	USPDX	42	34,865	1,329,357	703,562	110,571	10,215	1,023	11,382	1,287	0,182	49	25,084	1,218,688	702,591	109,148	9,872	8,758	99,288	0,083	1,641	295
CNTXG	CNTXG	USTIW	USPDX	4	3,140	125,056	67,335	10,578	10,134	97	1,084	0,123	0,017	49	2,399	116,572	67,206	10,440	9,915	651	7,400	0,006	0,120	230
CNYTN	CNYTN	USLAX	USCFR	22	15,991	765,372	439,281	68,306	11,803	15,683	761,955	439,278	68,242	11,783	11,406	584,149	319,475	49,631	11,783	3,017	3,418	0,003	0,064	20
CNYTN	CNYTN	USLAX	USGVP	16	25,211	766,325	319,698	58,472	15,705	11,406	584,149	319,475	49,631	11,783	13,805	212,176	131	5,941	11,783	13,805	212,176	0,131	5,941	3,922
CNYTN	CNYTN	USLGB	USCFR	395	286,372	13,737,967	7,890,698	1,226,694	11,804	281,696	13,695,777	7,890,653	1,225,727	11,788	4,676	52,090	0,044	0,966	11,788	4,676	52,090	0,044	0,966	17
CNYTN	CNYTN	USLGB	USFVT	2	2,491	65,663	39,360	6,657	14,209	1,426	69,295	39,360	6,206	11,788	1,065	16,368	0,010	0,451	11,788	1,065	16,368	0,010	0,451	2,423
CNYTN	CNYTN	USLGB	USGVP	104	211,631	6,428,731	2,677,728	444,331	15,725	95,563	4,642,770	2,676,626	415,816	11,788	116,068	1,783,961	1,103	49,114	11,788	116,068	1,783,961	1,103	49,114	3,938
CNYTN	CNYTN	USSEA	USGVP	508	754,444	22,387,821	9,079,115	1,591,955	14,549	324,003	15,741,184	9,075,026	1,409,814	10,542	430,441	6,615,836	4,089	182,111	10,542	430,441	6,615,836	4,089	182,111	4,006
CNYTN	CNYTN	USSEA	USPDX	56	47,394	1,867,632	1,000,508	157,600	10,637	35,717	1,735,249	1,000,397	155,413	10,542	11,677	132,384	0,111	2,188	10,542	11,677	132,384	0,111	2,188	295
CNYTN	CNYTN	USSEA	USSEA	2	1,297	62,209	35,729	5,595	10,557	1,276	61,973	35,728	5,550	10,542	21	0,236	0,000	0,005	10,542	21	0,236	0,000	0,005	15
CNYTN	CNYTN	USTIW	USGVP	64	96,206	2,840,013	1,148,512	201,708	14,662	40,996	1,991,253	1,147,987	178,341	10,585	55,222	848,760	0,525	23,367	10,585	55,222	848,760	0,525	23,367	4,077
CNYTN	CNYTN	USTIW	USPDX	11	8,935	362,596	197,327	30,983	10,915	7,045	342,247	197,310	30,852	10,585	1,790	20,349	0,017	0,330	10,585	1,790	20,349	0,017	0,330	230
HKHKG	HKHKG	USLAX	USCFR	2	1,472	69,798	39,958	6,217	11,828	17	0,180	0,001	0,004	16	1,427	69,307	39,957	6,207	11,790	28	0,311	0,000	0,006	20
HKHKG	HKHKG	USLGB	USCFR	133	97,638	4,640,386	2,658,182	413,331	11,827	1,141	11,940	0,036	0,260	16	94,903	4,610,707	2,658,141	412,945	11,794	1,574	17,539	0,015	0,325	17
HKHKG	HKHKG	USLGB	USGVP	2	3,177	98,340	39,989	6,947	15,745	17	0,180	0,001	0,004	16	1,427	69,334	39,972	6,210	11,794	1,732	26,626	0,016	0,733	3,938
HKHKG	HKHKG	USSEA	USPDX	119	101,790	3,981,715	2,127,444	335,341	10,960	1,021	10,683	0,032	0,233	16	75,946	3,689,796	2,127,176	330,459	10,549	24,814	281,395	0,236	4,649	295
HKHKG	HKHKG	USTIW	USPDX	4	3,249	132,230	71,001	11,281	10,838	34	0,359	0,001	0,008	16	2,563	124,531	71,794	11,953	10,592	651	7,400	0,006	0,120	230
JFNGO	JFNGO	USLAX	USCFR	2	1,205	57,231	32,804	5,102	9,705	6	0,021	0,000	0,000	6	1,171	56,900	32,803	5,096	9,679	28	0,311	0,000	0,006	20
JFNGO	JFNGO	USLAX	USGVP	2	2,903	83,442	32,920	5,826	13,607	6	0,021	0,000	0,000	6	1,171	56,900	32,803	5,096	9,679	1,726	26,522	0,016	0,730	3,922
JFNGO	JFNGO	USLGB	USCFR	1	601	28,605	16,409	2,552	9,706	3	0,010	0,000	0,000	6	596	28,463	16,409	2,549	9,684	12	0,132	0,000	0,002	17

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