# Einbindung der Binnenschifffahrt in Emissionsrechner:

# EcoTransIT World

Wolfram Knörr

ZKR – Round Table Strasbourg 24. April 2013

# EcoTransIT World Business Solutions users

## Members/ Users


## In contact for a Project

# EcoTransIT World enables…

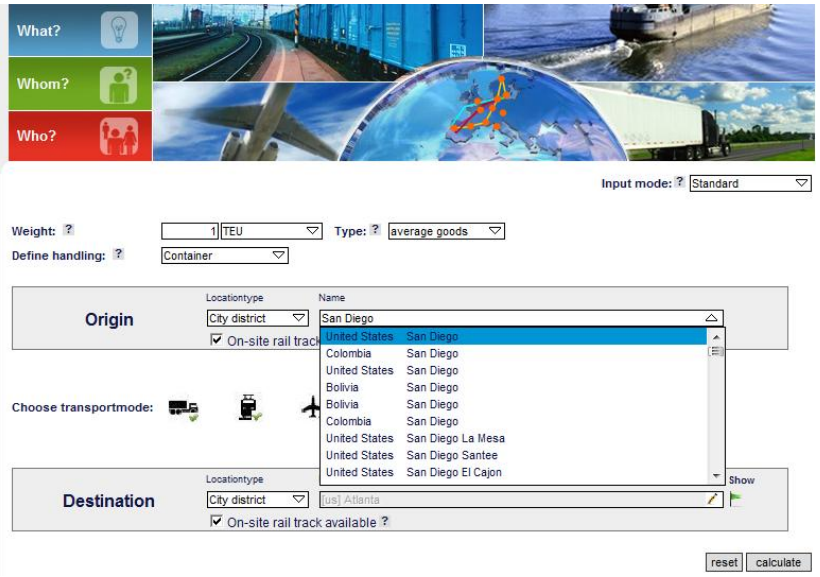
## … our customers to model their environmental impact

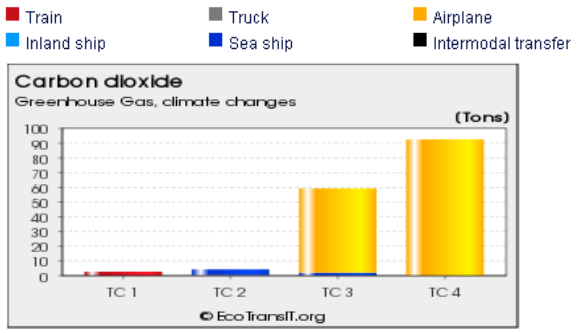
- for any individual shipment worldwide including empty trips
- for different types of goods
  Volume, average, bulk
- for all transport modes
  Truck, train, inland water ship, sea ship, airplane, intermodal transport
- for all types of fuels: Gasoline, diesel, kerosene, heavy fuel oil, electricity
- for all types of emission standards (Euro 0-5, JP, EPA)
- for most common sizes of vehicles
- for all relevant types of airplanes and ships


**www.ecotransit.org**

# Principal characteristics, in- & output

- **Input:** Standard / Expert mode
- **Modal locations** (ZIP, IATA, UIC, UN/LOCODE) + Google maps function
- Modal, route & goods characteristics
- Supply chain calculation & comparison
- **Output parameters**
  - $CO_2$ / $CO_2$-equivalents (GHG)
  - Energy consumption
  - NOx
  - $SO_2$
  - NMHC
  - Particles ($PM_{10}$)
  - Well to tank / tank to wheel
- **Graphic output** of figures, tables & routes



# EcoTransIT World combines scientific expertise & logistics reality

- "**Well to wheel"** energy and emissions calculation, not just final consumption.
- **Carrier data** as specific as possible – system, not company approach.
- **GIS-based networks** of all transport modes are integrated to enable realistic routing.
- **Expert mode:** The customers can select a comprehensive set of parameters, so as to **personalize their queries** and adapt it to their corporate design.
- **It is a live tool**: updates are done regularly.
- **Independent institutes** provide the methodology – global, public & free of charge.


IVE mbH
Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology
ifeu
ifeu - Institut für Energie- und Umweltforschung Heidelberg GmbH
rmcon
Rail Management Consultants

EcoTransIT World
Ecological Transport Information Tool for Worldwide Transports

Methodology and Data

1st Report

IFEU Heidelberg
Öko-Institut
IVE / RMCON

Commissioned by:
DB Schenker Germany;
UIC (International Union of Railways)

Berlin – Hannover – Heidelberg, May 20th 2010

Methodology report may be downloaded at
http://www.ecotransit.org/download/ecotransit_background_report.pdf

# EcoTransIT World – focusing on the customers' needs

## Reliable customer communication

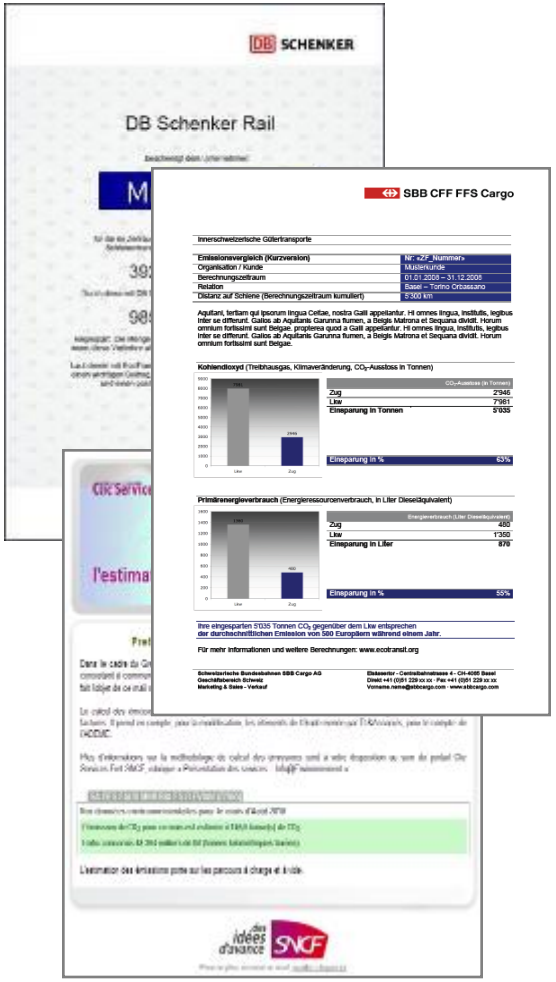
- create individual assessments for customers (single shipments or aggregated)
- get the tool adopted to corporate design

## Customer requirements for green accounting

- $CO_2$ data & reports – a future must to be contracted
- EcoTransIT World – a tool supporting business

## Reduce the customer's carbon footprint

- Identify saving potentials by benchmarking
- save costs by optimized logistic chains



# EcoTransIT World – 3 ways to utilize it

~~Data collection~~

**EcoTransIT World**


**Communication** → Environmental comparison of individual shipment

**Calculation /Reporting** → Carbon footprint of whole supply chain

**Benchmarking** → Use of carrier-specific emission factors, scenario feature for supply chain analysis

# Mass Calculation

1. **Goal**
   - Carbon accounting of lists of shipments for customer reports, inventories etc.
   - Automatical batch processing with customized input- / output-formats

1. **Approach**
   - User lists shipments (relations, weight/capacity and vehicle specific parameters)
   - Lists are sent to server at IVE mbH, Hannover
   - Calculation on the server in protected environment
   - Results are sent back to user in defined format

3. **User (up to date)**
   - DB Schenker
   - SBB Cargo
   - SNCF/Edifret
   - Trenitalia
   - Gebrüder Weiß
   - Hapag Lloyd

# Mass Calculation - Results

## Input / Output – Swiss example

Microsoft Excel - D9613246_UMWELT_Testdaten_aufbereitet.xls

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ZEITRAUM | ERLKMB | | VLDFB | VBF | | ELDFB | EBF | | GEW |
| 2 | 0701-0712 | 5208 | VOES | 51 | 19901 | TORUN WSCHODNI | 80 | 140517 | MANNHEIM-RHEINAU | 211 |
| 3 | 0701-0712 | 2083 | KNAUF | 51 | 32623 | PLOCK TRZEPOWO | 82 | 210005 | ESCH-BELVAL | 1.822 |
| 4 | 0701-0712 | 2083 | KNAUF | 51 | 32623 | PLOCK TRZEPOWO | 82 | 450007 | DIFFERDANGE | 2.165 |
| 5 | 0701-0712 | 2083 | KNAUF | 51 | 44008 | KROTOSZYN | 80 | 220434 | SCHWEINFURT HAFEN | 120 |
| 6 | 0701-0712 | 2083 | KNAUF | 54 | 336941 | KARVINA MESTO | 82 | 210005 | ESCH-BELVAL | 399 |
| 7 | 0701-0712 | 2083 | KNAUF | 54 | 337048 | KOPRIVNICE | 82 | 450007 | DIFFERDANGE | 220 |
| 8 | 0701-0712 | 2083 | KNAUF | 54 | 343640 | OSTRAVA HLAVNI N. | 82 | 450007 | DIFFERDANGE | 43 |
| 9 | 0701-0712 | 2083 | KNAUF | 54 | 344143 | OSTRAVA-KUNCICE | 81 | 31559 | KAPFENBERG | 5.021 |
| 10 | 0701-0712 | 2083 | KNAUF | 54 | 344143 | OSTRAVA-KUNCICE | 81 | 31559 | KAPFENBERG | 2.723 |
| 11 | 0701-0712 | 2083 | KNAUF | 54 | 344143 | OSTRAVA-KUNCICE | 82 | 210005 | ESCH-BELVAL | 2.255 |
| 12 | 0701-0712 | 2083 | KNAUF | 54 | 344143 | OSTRAVA-KUNCICE | 82 | 450007 | DIFFERDANGE | 886 |
| 13 | 0701-0712 | 2083 | KNAUF | 54 | 344143 | OSTRAVA-KUNCICE | 82 | 210005 | ESCH-BELVAL | 1.753 |
| 14 | 0701-0712 | 2083 | KNAUF | 54 | 352021 | LHOTKA NAD BECVOU | 82 | 450007 | DIFFERDANGE | 1.344 |
| 15 | 0701-0712 | 2083 | KNAUF | 54 | 531590 | USTI NAD LABEM ZAPAD | 82 | 210005 | ESCH-BELVAL | 546 |
| 16 | 0701-0712 | 2083 | KNAUF | 54 | 531590 | USTI NAD LABEM ZAPAD | 82 | 450007 | DIFFERDANGE | 1.828 |
| 17 | 0701-0712 | 2083 | KNAUF | 54 | 531590 | USTI NAD LABEM ZAPAD | 82 | 450007 | DIFFERDANGE | 94 |
| 18 | 0701-0712 | 2083 | KNAUF | 55 | 11726 | ALMASFUEZITOE | 81 | 31559 | KAPFENBERG | 1.059 |
| 19 | 0701-0712 | 2083 | KNAUF | 55 | 16287 | TOKOD | 82 | 210005 | ESCH-BELVAL | 3.410 |
| 20 | 0701-0712 | 2083 | KNAUF | 55 | 71126 | KELEBIA HATAR | 82 | 450007 | DIFFERDANGE | 2.391 |
| 21 | 0701-0712 | 2083 | KNAUF | 56 | 132266 | BRATISLAVA UNS | 82 | 210005 | ESCH-BELVAL | 1.023 |
| 22 | 0701-0712 | 2083 | KNAUF | 56 | 132266 | BRATISLAVA UNS | 82 | 210005 | ESCH-BELVAL | 804 |
| 23 | 0701-0712 | 2083 | KNAUF | 56 | 152801 | HANISKA PRI KOSICIAC | 82 | 450007 | DIFFERDANGE | 226 |
| 24 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 20842 | GUENZBURG | 23 |
| 25 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 62752 | ZEITHAIN ROHRWERK | 637 |
| 26 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 100198 | GLADBECK WEST | 254 |
| 27 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 136895 | VINNHORST | 1.088 |
| 28 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 140517 | MANNHEIM-RHEINAU | 218 |
| 29 | 0701-0712 | 2083 | KNAUF | 71 | 793190 | PORT-BOU CADEFER | 80 | 221887 | FUERTH(BAY)HBF | 118 |

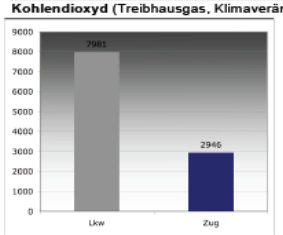
SBB CFF FFS Cargo

**Innerschweizerische Gütertransporte**

| | |
|---|---|
| **Emissionsvergleich (Kurzversion)** | **Nr: «ZF_Nummer»** |
| Organisation / Kunde | Musterkunde |
| Berechnungszeitraum | 01.01.2008 – 31.12.2008 |
| Relation | Basel – Torino Orbassano |
| Distanz auf Schiene (Berechnungszeitraum kumuliert) | 5'300 km |

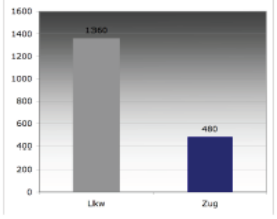
Aquitani, tertiam qui ipsorum lingua Celtae, nostra Galli appellantur. Hi omnes lingua, institutis, legibus inter se differunt. Gallos ab Aquitanis Garunna flumen, a Belgis Matrona et Sequana dividit. Horum omnium fortissimi sunt Belgae. propterea quod a Galli appellantur. Hi omnes lingua, institutis, legibus inter se differunt. Gallos ab Aquitanis Garunna flumen, a Belgis Matrona et Sequana dividit. Horum omnium fortissimi sunt Belgae.

**Kohlendioxyd** (Treibhausgas, Klimaveränderung, $CO_2$-Ausstoss in Tonnen)




| | $CO_2$-Ausstoss (In Tonnen) |
|---|---|
| Zug | 2'946 |
| Lkw | 7'981 |
| **Einsparung in Tonnen** | **5'035** |
| **Einsparung in %** | **63%** |

**Primärenergieverbrauch** (Energieressourcenverbrauch, in Liter Dieseläquivalent)




| | Energieverbrauch (Liter Dieseläquivalent) |
|---|---|
| Zug | 480 |
| Lkw | 1'350 |
| **Einsparung in Liter** | **870** |
| **Einsparung in %** | **55%** |

**Ihre eingesparten 5'035 Tonnen $CO_2$ gegenüber dem Lkw entsprechen der durchschnittlichen Emission von 500 Europäern während einem Jahr.**

**Für mehr Informationen und weitere Berechnungen: www.ecotransit.org**

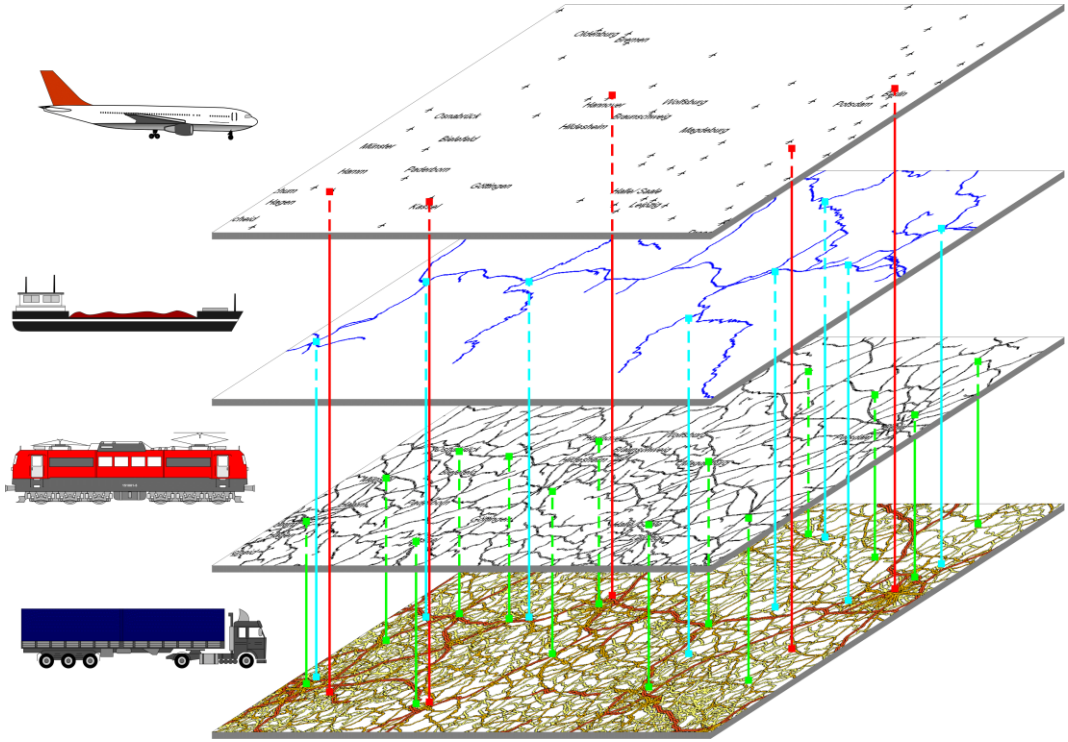

**Schweizerische Bundesbahnen SBB Cargo AG**
Geschäftsbereich Schweiz
Marketing & Sales - Verkauf

Elsässertor - Centralbahnstrasse 4 - CH-4065 Basel
Direkt +41 (0)51 229 xx xx - Fax +41 (0)51 229 xx xx
Vorname.name@sbbcargo.com - www.sbbcargo.com

# Methodology Inland Shipping

# Easy handling by GIS-based routing

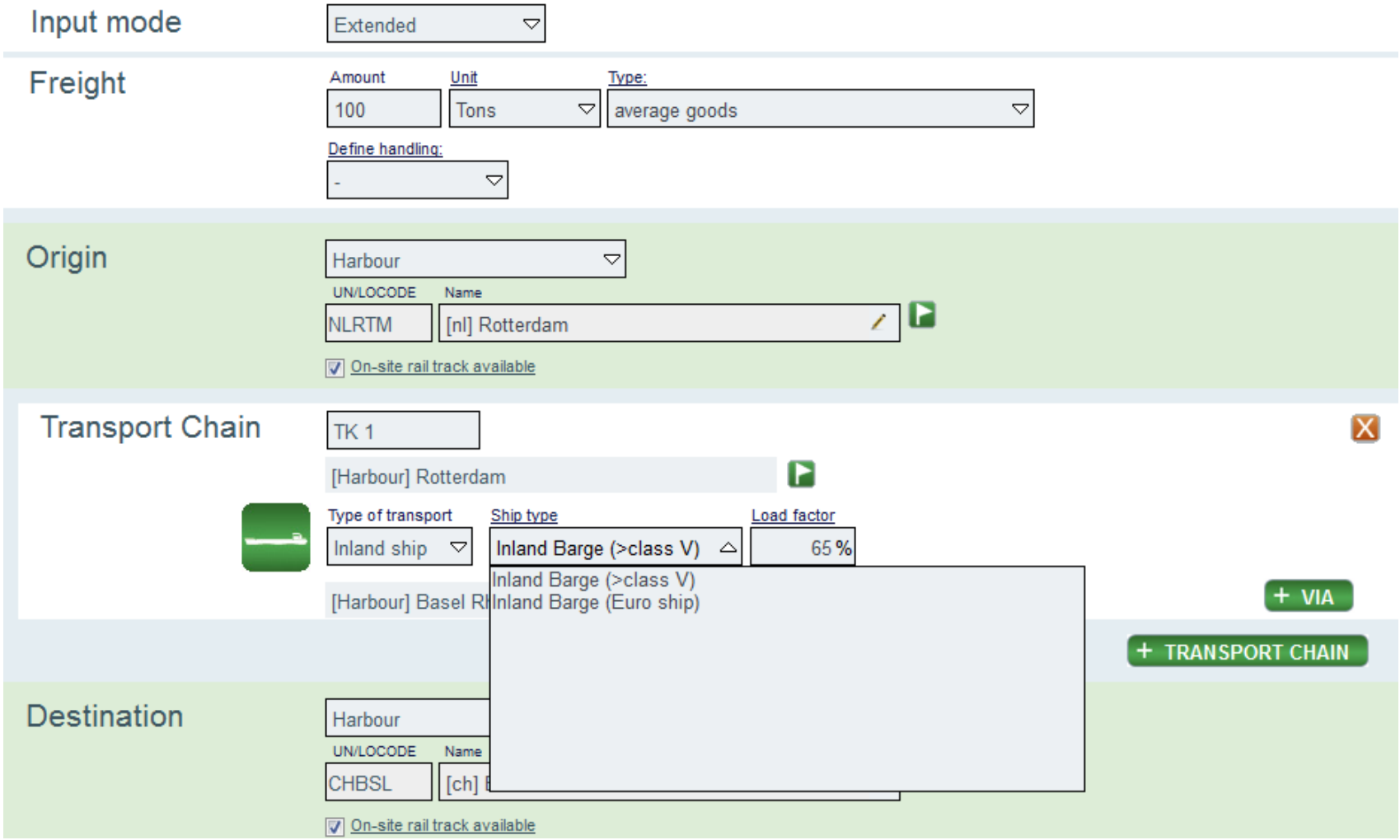
- Global networks of all transport modes available
- Routing software identifies best way to / from any place in the world



# Inland Waterways

- 549 Ports
- Differentiation Waterways
  < Class V
  >=Class V

# Inland Waterway Calculation - Input



# Inland Waterway Calculation - Result

## CALCULATION PARAMETERS

Weight: 100 Tons
Define handling: -

change

Transport Chain TK 1

Origin: Rotterdam
Type: Inland Barge (>class V)
LF: 65.0%
Destination: Basel Rheinhäfen

change

## ACCOUNTING PROFIT

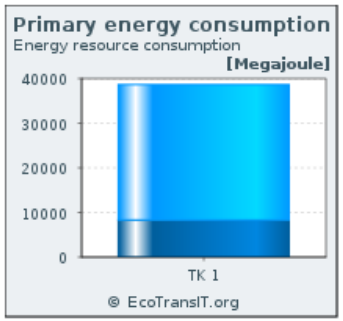
STANDARD | GRAPH | TABLE | DISTANCES

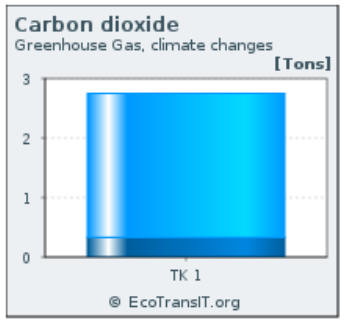
CSV DOWNLOAD PDF DOWNLOAD

Show well to tank / tank to wheel ☑

**Energy unit:** ◉ Megajoule ○ Kilowatthours ○ Diesel equivalents

■ Inland ship well to tank
■ Inland ship tank to wheel




**Primary energy consumption**
Energy resource consumption
[Megajoule]

| | TK 1 |
|---|---|
| Inland ship (WTT) | 8.334 |
| Inland ship (TTW) | 30.296 |
| **Sum:** | **38.630** |

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**Carbon dioxide**
Greenhouse Gas, climate changes
[Tonnes]

| | TK 1 |
|---|---|
| Inland ship (WTT) | 0,33 |
| Inland ship (TTW) | 2,42 |
| **Sum:** | **2,75** |

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# Binnenschifffahrt – Aktuelle Methodik

- Zwei Schiffstypen auswählbar (Europaschiff, >=Class V Schiff).
- Auslastung (Ausnutzung der Kapazität) wählbar.
- Keine Unterscheidung Berg- und Talfahrt (Mittelwert).
- Motorauslastung und Anteil Hilfsmotoren festgelegt (Mittelwert).
- -> bisher nur eingeschränkte Verwendbarkeit zur Bestimmung der Emissionen für konkrete Transportvorgänge und für Gesamtbilanzen.

# Binnenschifffahrt – Planungen 2013

- Kompatibilität mit der neuen CEN Norm EN 16258.
- Integration der aktuellen Erkenntnisse aus dem UBA-TREMOD-Projekt in EcoTransIT (neue Verbrauchs- und Emissionsfaktoren).
- Abgleich der Ergebnisse mit Realwerten konkreter Schiffsflotten (Contargo, Compagnie Fluviale de Transport).
- Noch keine Entscheidung über Erweiterung des Moduls “Binnenschifffahrt”: abhängig von Wünschen der Nutzer und der finanziellen Ausstattung.
- Mitarbeit der ZKR und des Schifffahrtsgewerbes ist zum jetzigen Zeitpunkt sehr erwünscht und sollte in weitergehenden Gesprächen konkretisiert werden.

# Contact


**www.ecotransit.org**

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