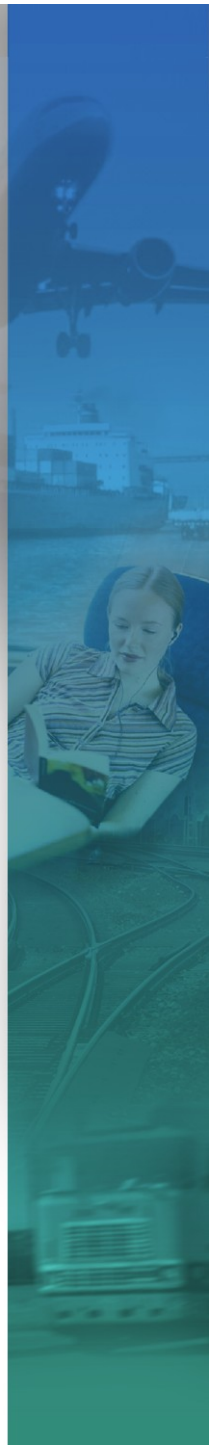
NTM

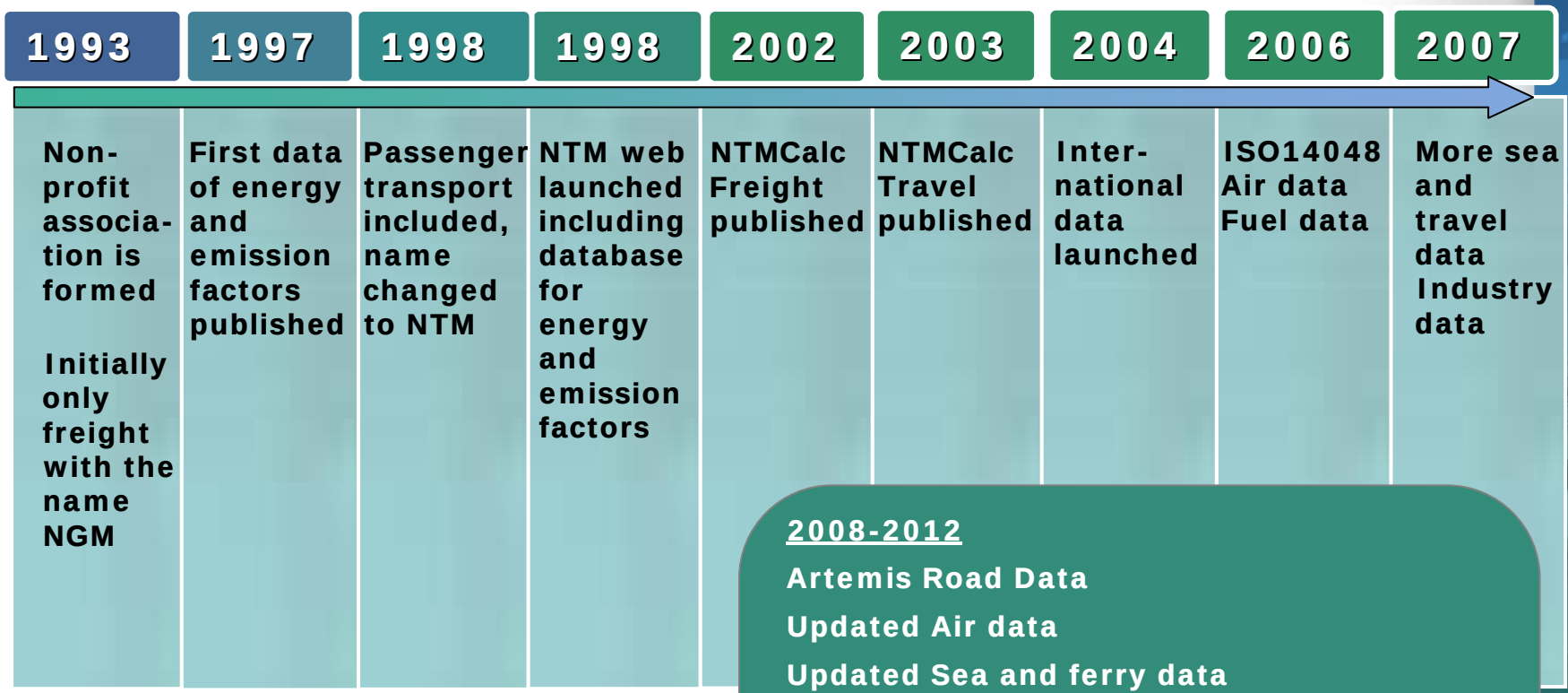
Network for Transport and Environment



Challenges within:
Environmental performance assessment in supply chains

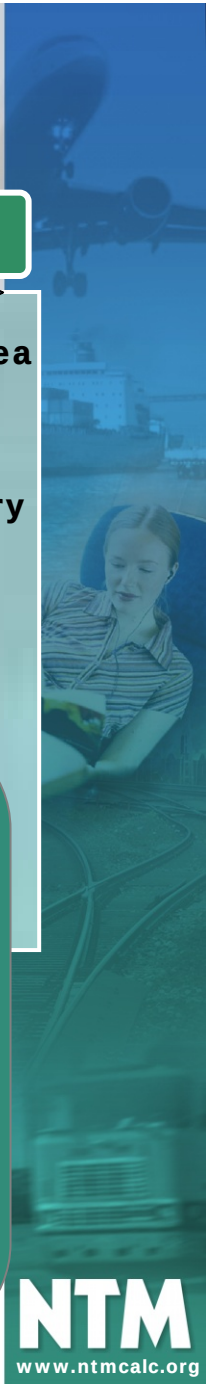
Magnus Swahn

Background of the Network for transport and environment



2008-2012

- Artemis Road Data
- Updated Air data
- Updated Sea and ferry data
- Updated Rail data
- New homepage
- General methodology paper / supply chain
- New basic calculation tool
- NTMCalc 3.0
- Standardization process
- Nordic network



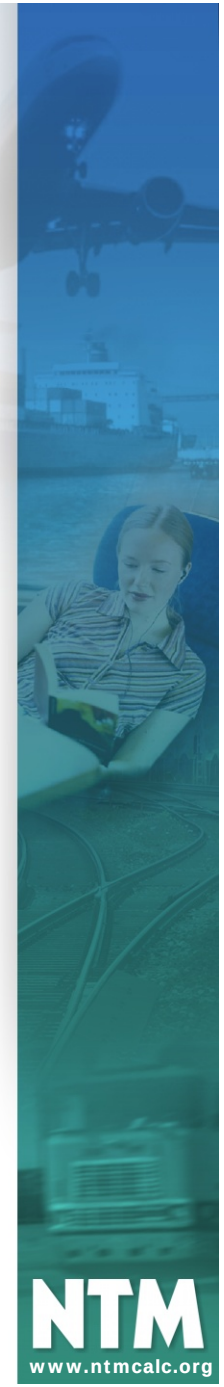
Objective

In order to promote and develop the environmental work in the transport sector, the Network for Transport and Environment (NTM) ***acts for a common and accepted method for calculation of emissions, use of natural resources and other external effects from goods and passenger transport****. The method is primarily developed for buyers and sellers of transport services, hence enabling evaluation of the environmental impact from their own transports.*

NTM offers:

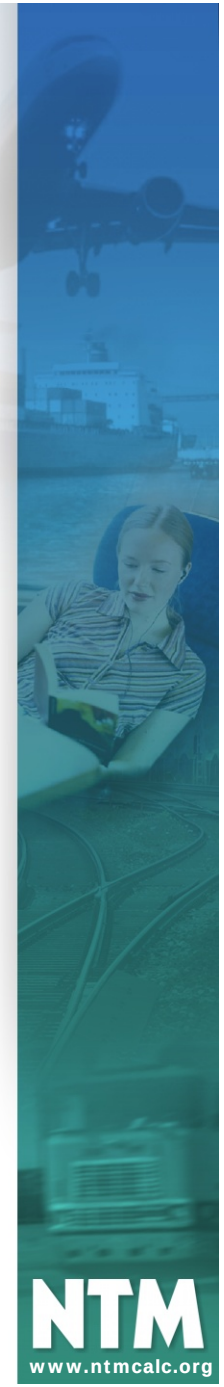
- *A calculation method and relevant environmental data*
- *Tools for supplier evaluation*
- *A forum for exchange of knowledge and experiences in the field of environmental impact from transport*

This is developed in mutual understanding within the working groups of NTM by the members and in cooperation with other stakeholders. The work is communicated via the NTM homepage, reports, educations, member meetings and a newsletter.

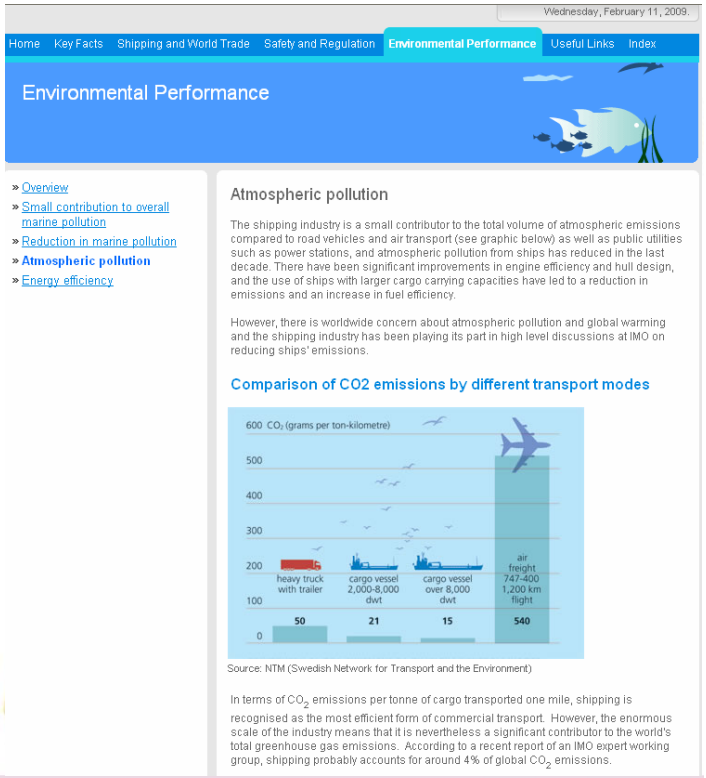


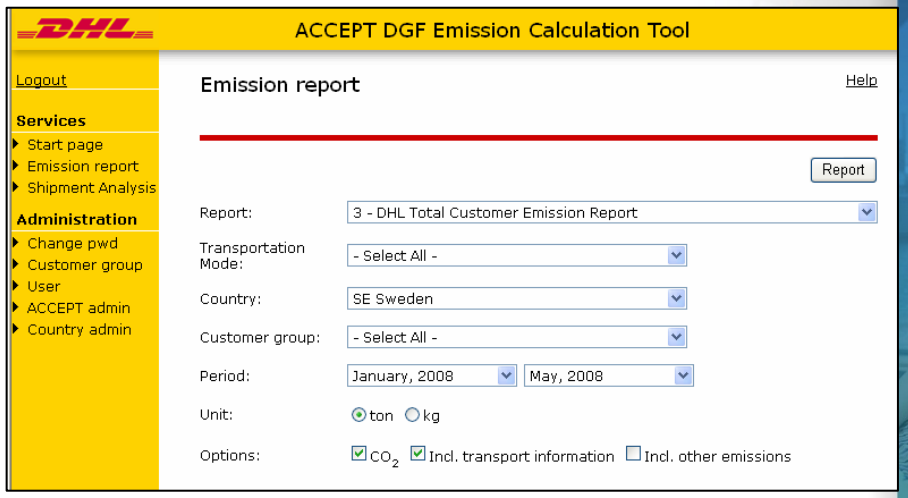
General achievements

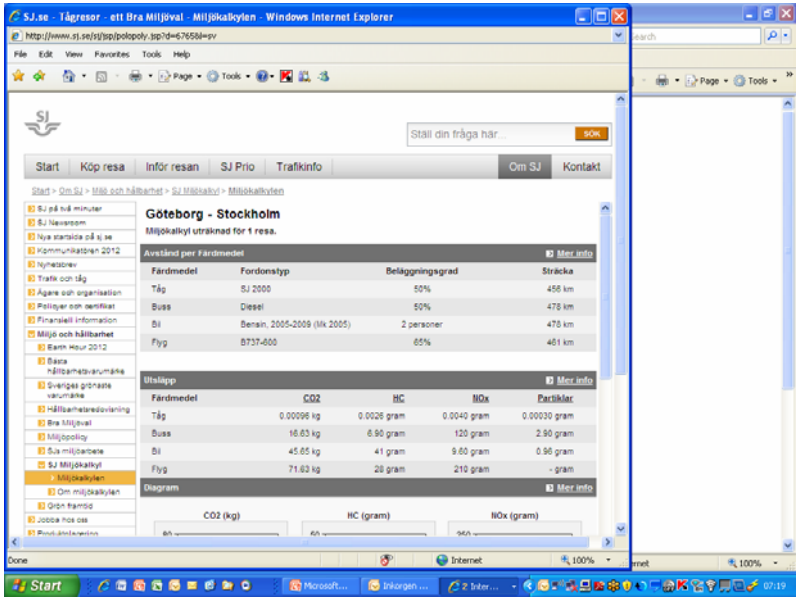
- NTM develops and are actively developing methodologies and data for energy and emission calculations
- NTM has built a platform of independent relevant data for goods and passenger transport all modes
  - Offering relevant data
  - Traffic neutral e.g. usefulness
  - Continuous improvements
- NTM provides models for transport supplier evaluation and procurement
- NTM organize WG- meetings, seminars, breakfast meetings and annually two member meetings with external speakers
- We are <u>not</u> an official body to which a proposed measure is referred for legal or other official consideration. Neutrality i.e. credibility is our key asset.



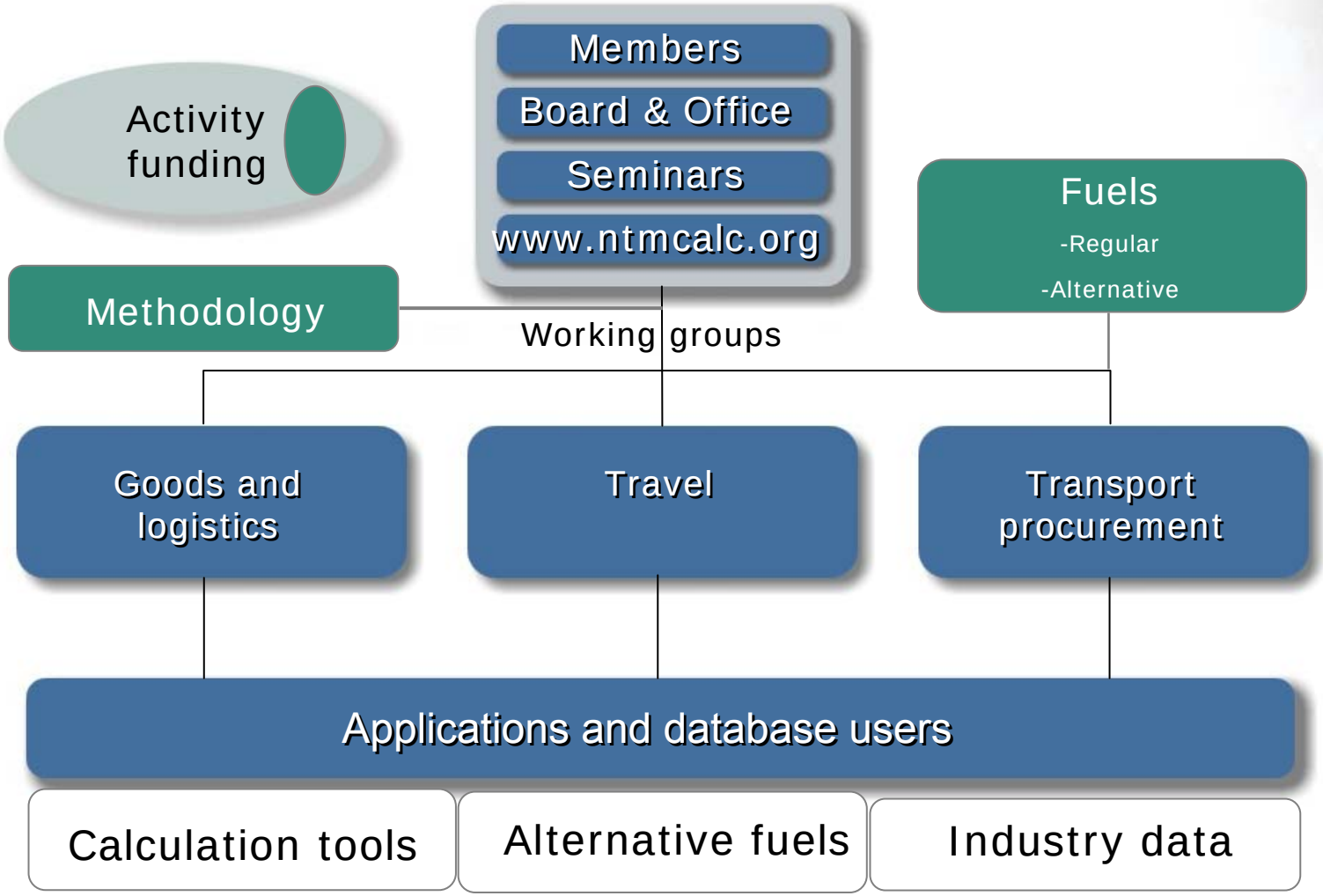
Calculators, input to other calculators and contribution to various NGOs impact on public opinion

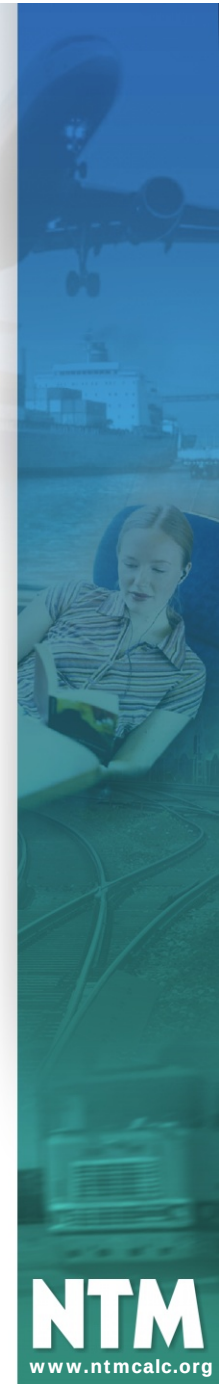






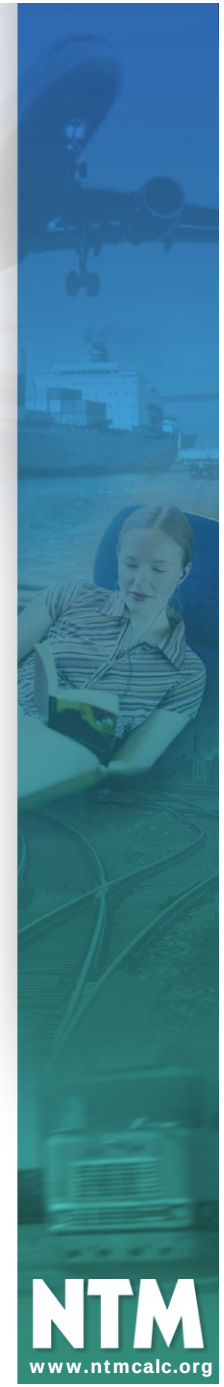
Organisation

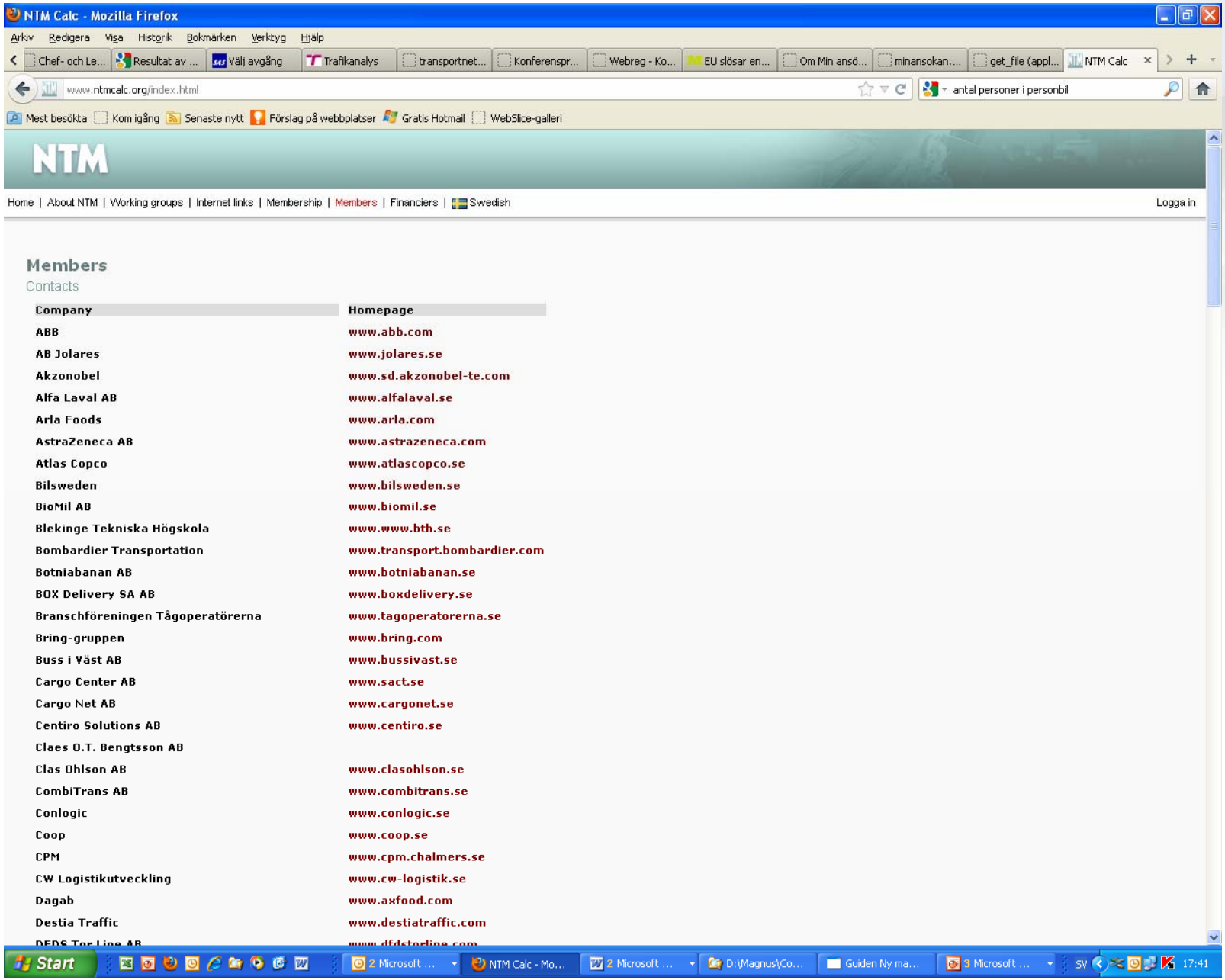




Our members are NTM

- The number of members, geographical spread of members and different types of members increases the credibility of the database.
- More members leads to a higher turnover which in turn enables a more professional work.




NTM Calc - Mozilla Firefox
www.ntmcalc.org/index.html
antal personer i personbil
NTM
Home | About NTM | Working groups | Internet links | Membership | Members | Financiers | Swedish
Logga in
Members
Contacts
Company
Homepage
ABB
www.abb.com
AB Jolares
www.jolares.se
Akzonobel
www.sd.akzonobel-te.com
Alfa Laval AB
www.alfalaval.se
Arla Foods
www.arla.com
AstraZeneca AB
www.astrazeneca.com
Atlas Copco
www.atlascopco.se
Bilsweden
www.bilsweden.se
BioMil AB
www.biomil.se
Blekinge Tekniska Högskola
www.www.bth.se
Bombardier Transportation
www.transport.bombardier.com
Botniabanan AB
www.botniabanan.se
BOX Delivery SA AB
www.boxdelivery.se
Branschföreningen Tågoperatörerna
www.tagoperatorerna.se
Bring-gruppen
www.bring.com
Buss i Väst AB
www.bussivast.se
Cargo Center AB
www.sact.se
Cargo Net AB
www.cargonet.se
Centiro Solutions AB
www.centiro.se
Claes O.T. Bengtsson AB
Clas Ohlson AB
www.clasohlson.se
CombiTrans AB
www.combitrans.se
Conlogic
www.conlogic.se
Coop
www.coop.se
CPM
www.cpm.chalmers.se
CW Logistikutveckling
www.cw-logistik.se
Dagab
www.axfood.com
Destia Traffic
www.destiatraffic.com
Start
NTM Calc - Mo...
17:41

Board

Chairman:

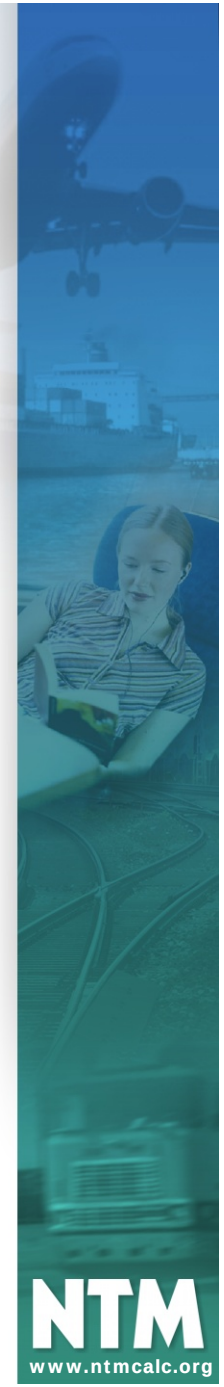
Jörgen Stadler	Bring Frigo

Board members:

Carl Carlsson	Swedish Ship Owners Association
Catherine Löfquist	Bring Express
Jerker Sjögren	Closer
Urban Wästljung	Scania
Monica Jadsén Holm	Schenker
Ulrika Wennergren	Trafikverket
Ingela Melkersson	Train operators Association
Linda Bergsten	DHL

Deputy members

Anna Wilson	Swedish Aviation Association
Susanna Fink	Postnord



NTM Calc - Windows Internet Explorer

http://www.ntmcalc.org/index.html

File Edit View Favorites Tools Help

NTM Calc

NTM

Home | About NTM | Working groups | Internet links | Membership | Members | Financiers | Swedish

Logga in

General methods and data

Following methods and data are publicly available

- Basic freight calculator
- Basic travel calculator
- Transport procurement
- Fuels
- Library

Detailed methods and data

Access of detailed methods, data and library requires a user account with a password. For students and other special occasions we offer temporary user accounts. Contact NTM about this.

- Goods & Logistics
- Travel
- Fuels
- Library

Log in order to access advanced methods and data:

Username

password

Log in

News

NTM presents a conversation with Alan McKinnon (Nov2010)

Log in on the web page and visit the library and look at Alan McKinnon´s presentations and paper on, Adaptive logistics and Lecture at VTI

Now available, new well to wheel fuel data on the web page under detailed methods and data for fuel.

Meetings

Annual meeting 2012
The annual meeting was held the 24th of April in Gothenburg, 10:00-18:00.
Location: Handelshögskolan i Göteborg

Done

Internet

100%

Start

3 Micr...

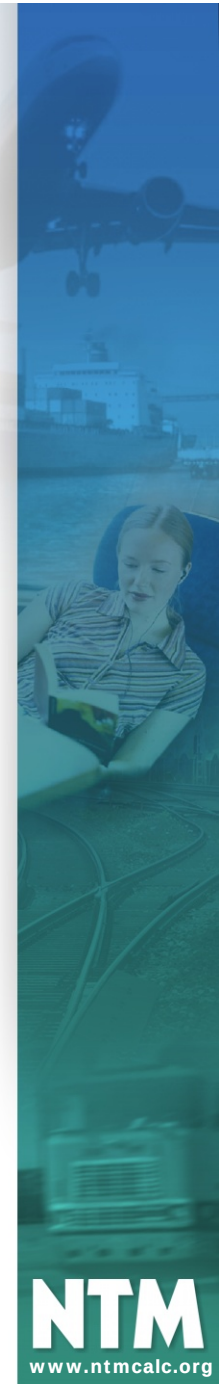
Inkorge...

NTM Cal...

07:31

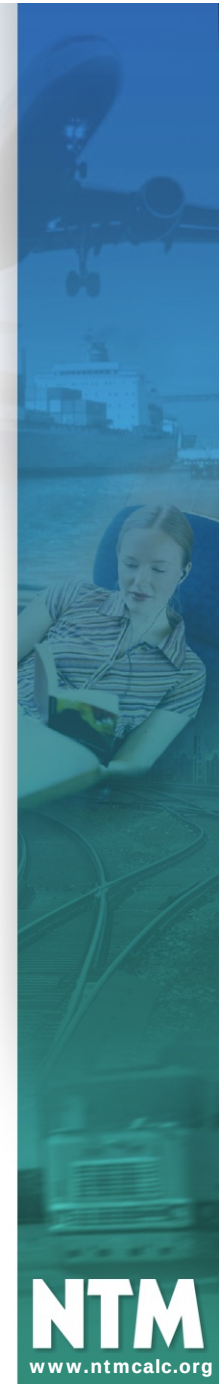
The challenges for an environmental calculator

- Easy to handle
- Limited amount of input data
- Cost efficient
- Repetitive with reliability
- Deliver accurate results (and uncertainty?)
- Enable improvement measurements

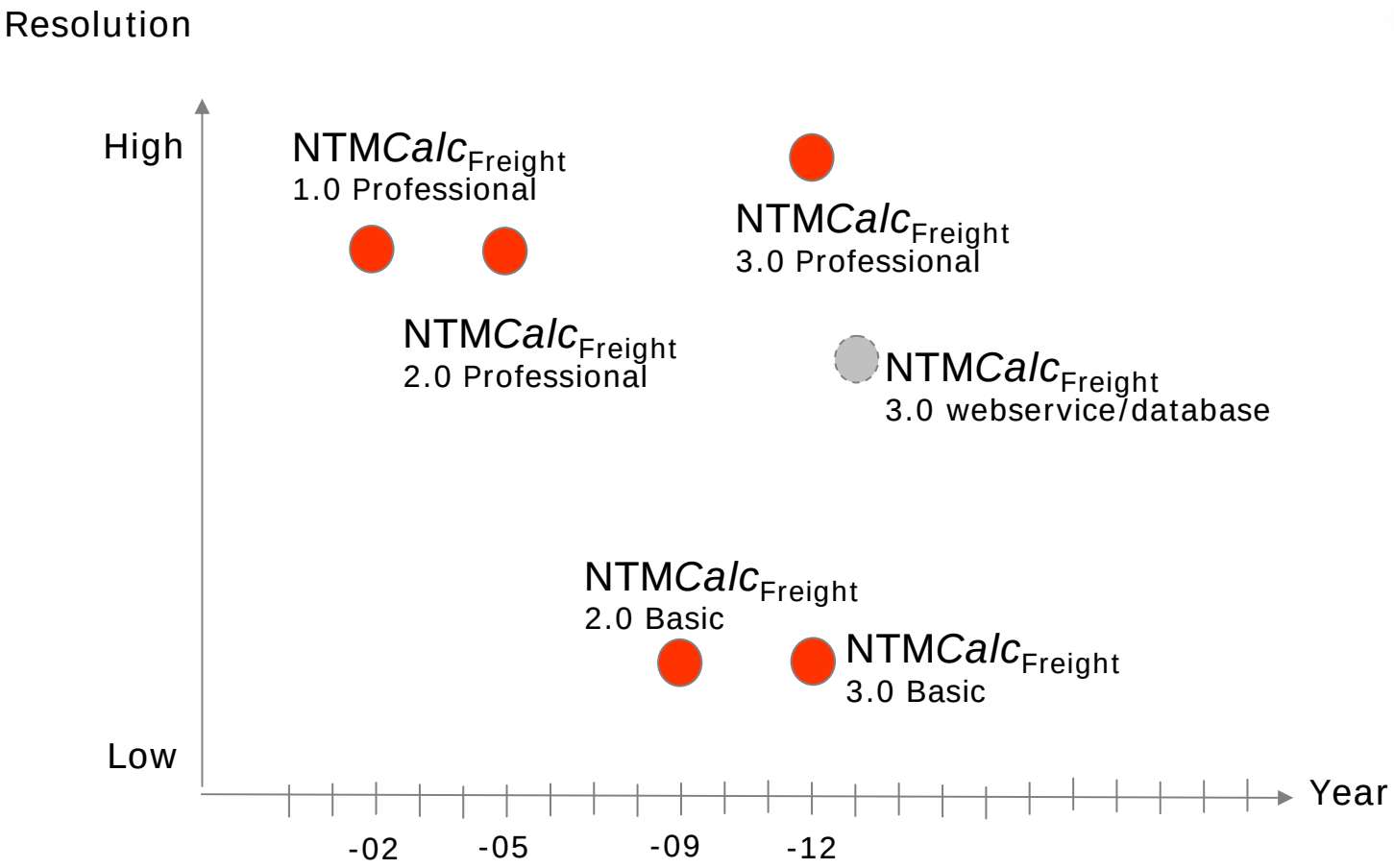


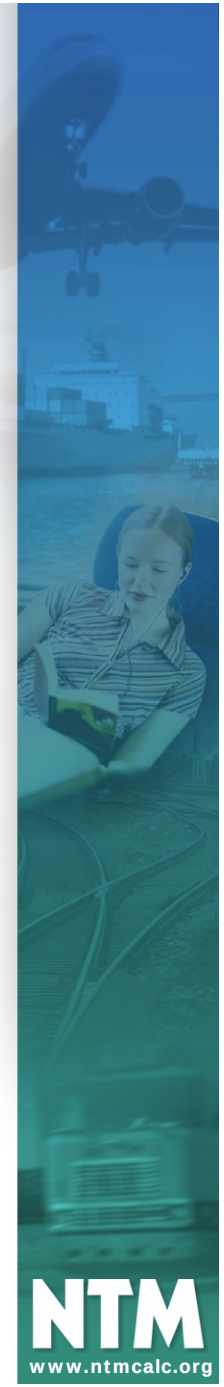
NTM environmental performance tools

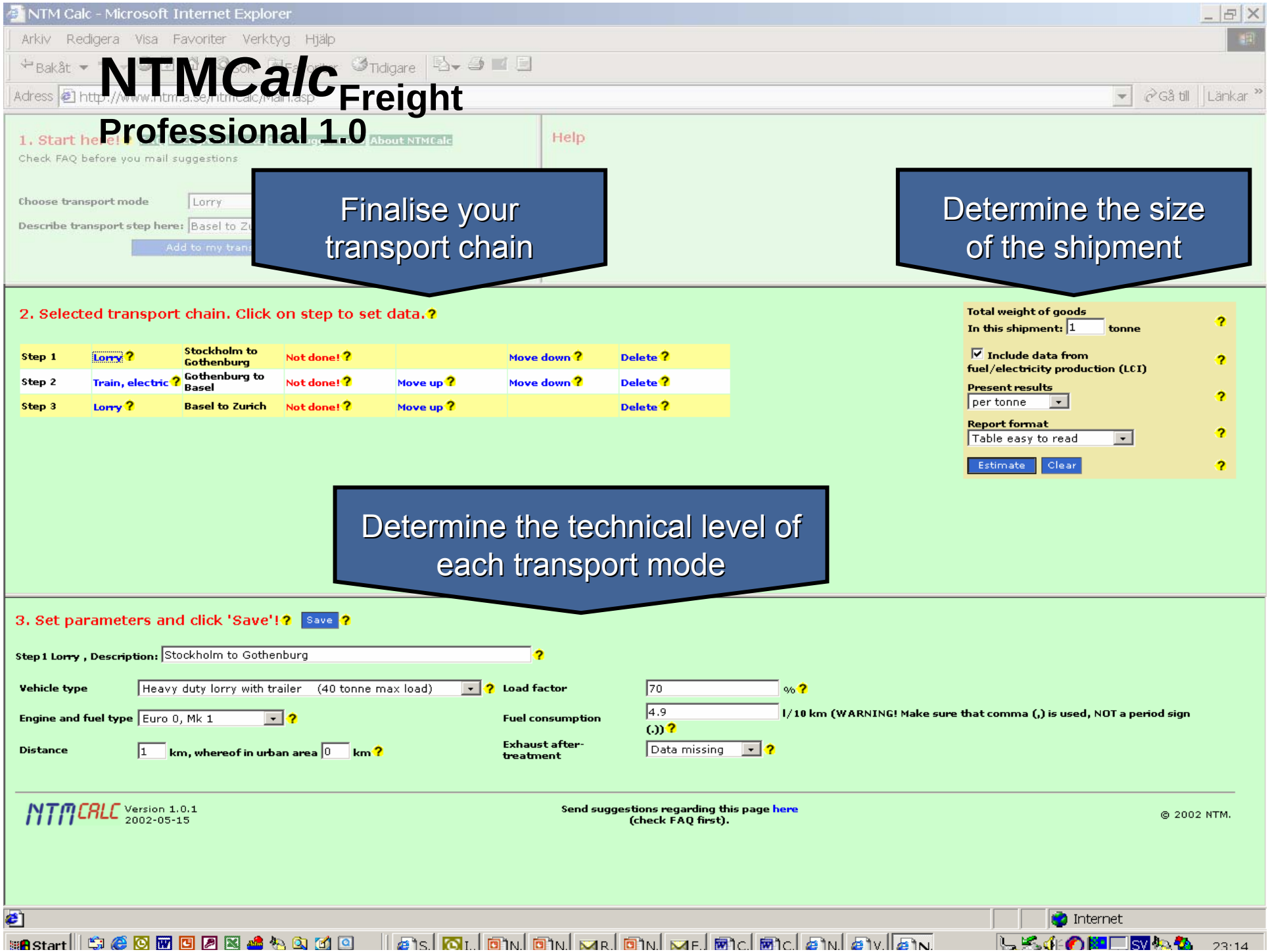
NTM Tools	Option	Capabilities
NTM*Calc* *Freight/Travel*	Basic	Fixed assumptions
NTM*Calc* *Freight/Travel*	Professional	Flexible assumptions
		Standard API
		Web services/database service



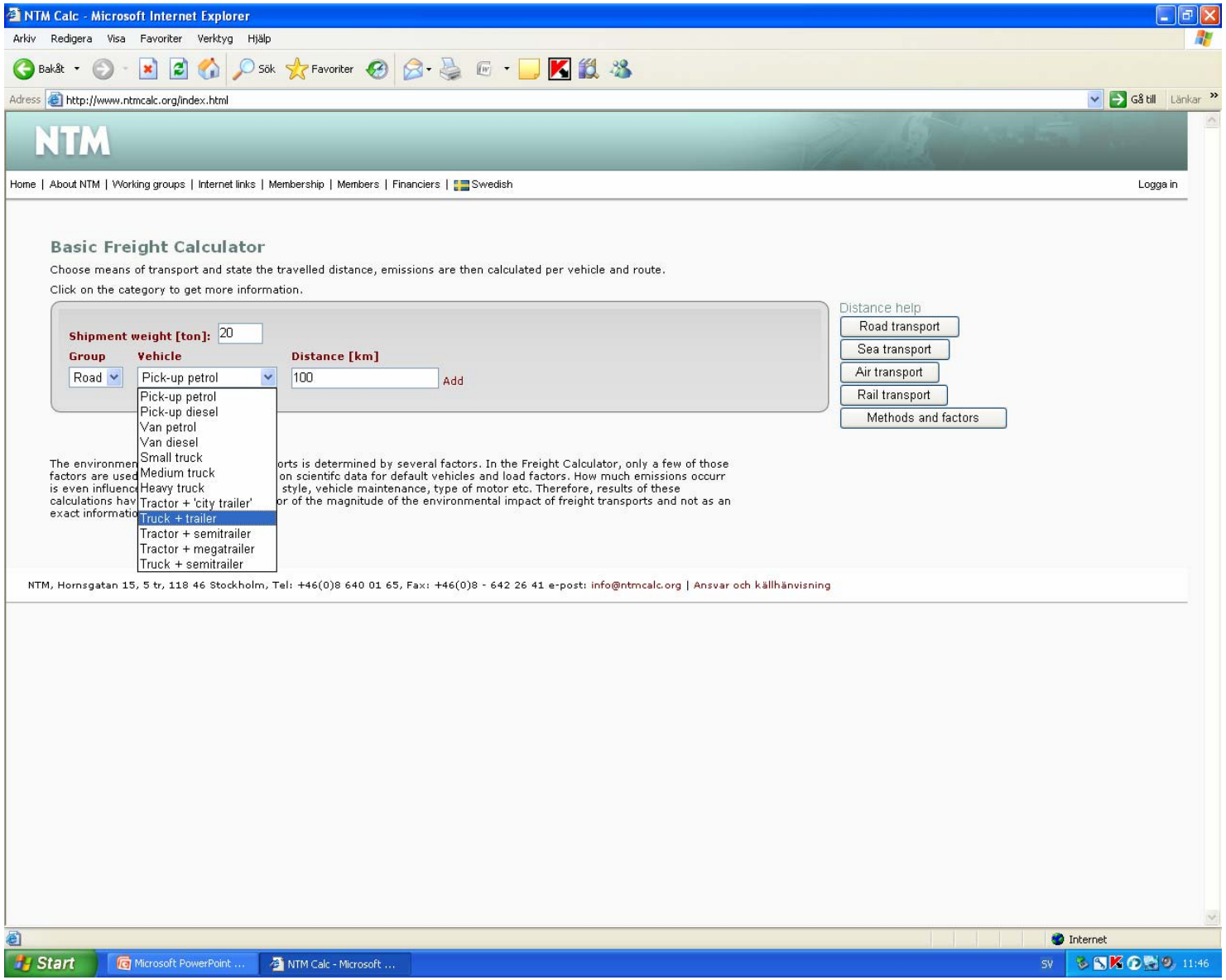
NTM*Calc*$_{Freight}$

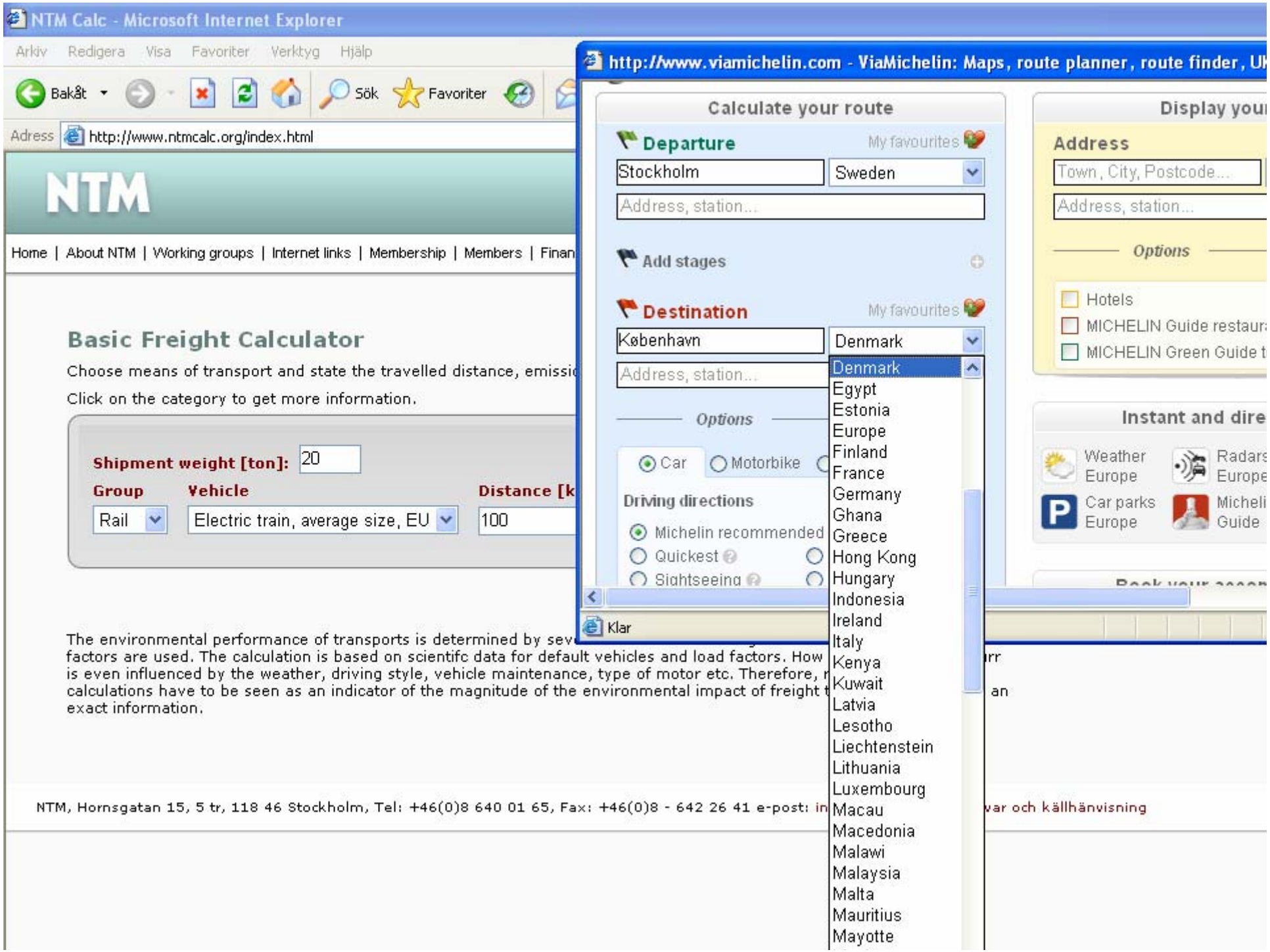


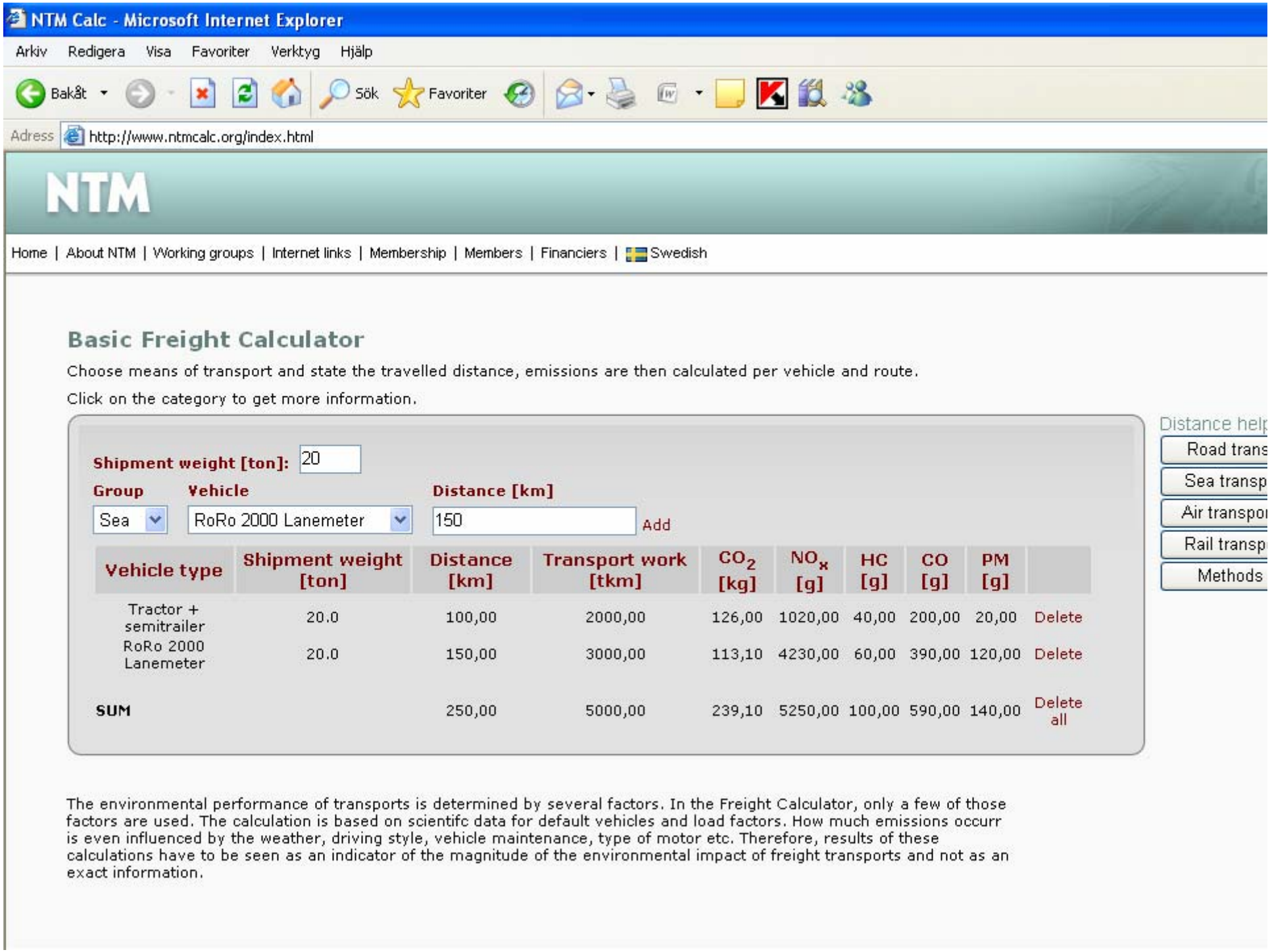



NTM Calc - Microsoft Internet Explorer
NTMCalc Freight Professional 1.0
Finalise your transport chain
Determine the size of the shipment
Determine the technical level of each transport mode
2. Selected transport chain. Click on step to set data.
Step 1 Lorry Stockholm to Gothenburg Not done! Move down Delete
Step 2 Train, electric Gothenburg to Basel Not done! Move up Move down Delete
Step 3 Lorry Basel to Zurich Not done! Move up Delete
Total weight of goods In this shipment: 1 tonne
Include data from fuel/electricity production (LCI)
Present results per tonne
Report format Table easy to read
Estimate Clear
3. Set parameters and click 'Save'! Save
Step 1 Lorry , Description: Stockholm to Gothenburg
Vehicle type Heavy duty lorry with trailer (40 tonne max load)
Load factor 70 %
Engine and fuel type Euro 0, Mk 1
Fuel consumption 4.9 l/10 km (WARNING! Make sure that comma (,) is used, NOT a period sign (.))
Distance 1 km, whereof in urban area 0 km
Exhaust after-treatment Data missing
NTMCALC Version 1.0.1 2002-05-15
Send suggestions regarding this page here (check FAQ first).
© 2002 NTM.

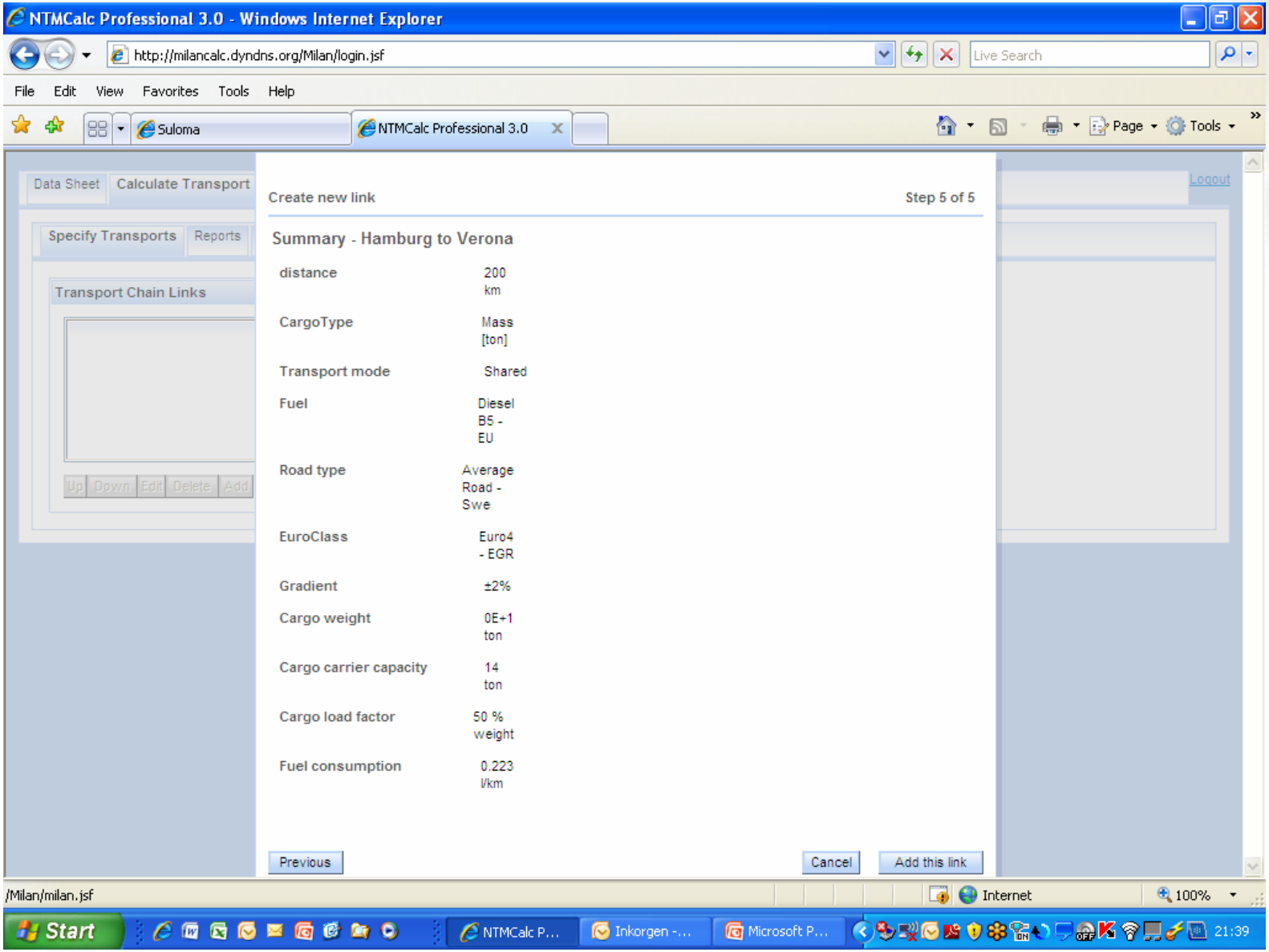
NTM*Calc*Freight
Basic 2.0

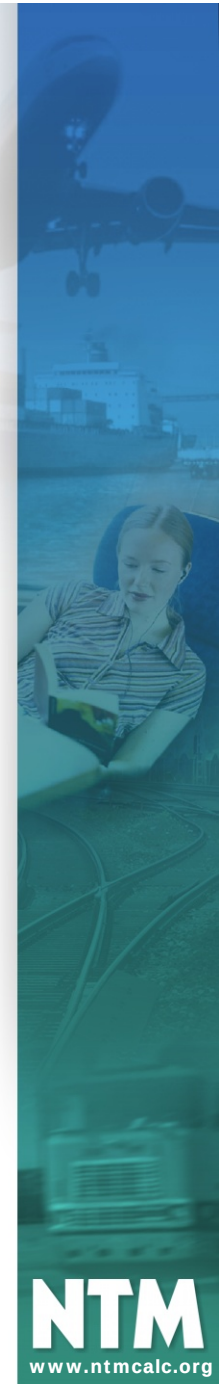



NTM Calc - Microsoft Internet Explorer
Arkiv Redigera Visa Favoriter Verktyg Hjälp
Bakåt
Sök
Favoriter
Adress
http://www.ntmcalc.org/index.html
NTM
Home | About NTM | Working groups | Internet links | Membership | Members | Finan
Basic Freight Calculator
Choose means of transport and state the travelled distance, emissi
Click on the category to get more information.
Shipment weight [ton]:
20
Group
Vehicle
Distance [k
Rail
Electric train, average size, EU
100
The environmental performance of transports is determined by sev
factors are used. The calculation is based on scientifc data for default vehicles and load factors. How
is even influenced by the weather, driving style, vehicle maintenance, type of motor etc. Therefore,
calculations have to be seen as an indicator of the magnitude of the environmental impact of freight
exact information.
NTM, Hornsgatan 15, 5 tr, 118 46 Stockholm, Tel: +46(0)8 640 01 65, Fax: +46(0)8 - 642 26 41 e-post:
var och källhänvisning
http://www.viamichelin.com - ViaMichelin: Maps, route planner, route finder, UK
Calculate your route
Departure
My favourites
Stockholm
Sweden
Address, station...
Add stages
Destination
My favourites
København
Denmark
Address, station...
Options
Car
Motorbike
Driving directions
Michelin recommended
Quickest
Sightseeing
Klar
Denmark
Egypt
Estonia
Europe
Finland
France
Germany
Ghana
Greece
Hong Kong
Hungary
Indonesia
Ireland
Italy
Kenya
Kuwait
Latvia
Lesotho
Liechtenstein
Lithuania
Luxembourg
Macau
Macedonia
Malawi
Malaysia
Malta
Mauritius
Mayotte
Display you
Address
Town, City, Postcode...
Address, station...
Options
Hotels
MICHELIN Guide restaur
MICHELIN Green Guide t
Instant and dire
Weather Europe
Radars Europe
Car parks Europe
Michel Guide


NTM Calc - Microsoft Internet Explorer
Arkiv Redigera Visa Favoriter Verktyg Hjälp
Bakåt
Sök
Favoriter
Adress
http://www.ntmcalc.org/index.html
NTM
Home | About NTM | Working groups | Internet links | Membership | Members | Financiers | Swedish
Basic Freight Calculator
Choose means of transport and state the travelled distance, emissions are then calculated per vehicle and route.
Click on the category to get more information.
Shipment weight [ton]: 20
Group
Vehicle
Distance [km]
Sea
RoRo 2000 Lanemeter
150
Add
Vehicle type
Shipment weight [ton]
Distance [km]
Transport work [tkm]
CO2 [kg]
NOx [g]
HC [g]
CO [g]
PM [g]
Tractor + semitrailer
20.0
100,00
2000,00
126,00
1020,00
40,00
200,00
20,00
Delete
RoRo 2000 Lanemeter
20.0
150,00
3000,00
113,10
4230,00
60,00
390,00
120,00
Delete
SUM
250,00
5000,00
239,10
5250,00
100,00
590,00
140,00
Delete all
Distance help
Road trans
Sea transp
Air transpor
Rail transp
Methods
The environmental performance of transports is determined by several factors. In the Freight Calculator, only a few of those factors are used. The calculation is based on scientifc data for default vehicles and load factors. How much emissions occurr is even influenced by the weather, driving style, vehicle maintenance, type of motor etc. Therefore, results of these calculations have to be seen as an indicator of the magnitude of the environmental impact of freight transports and not as an exact information.

NTM*Calc*$_{Freight}$
Professional 3.0

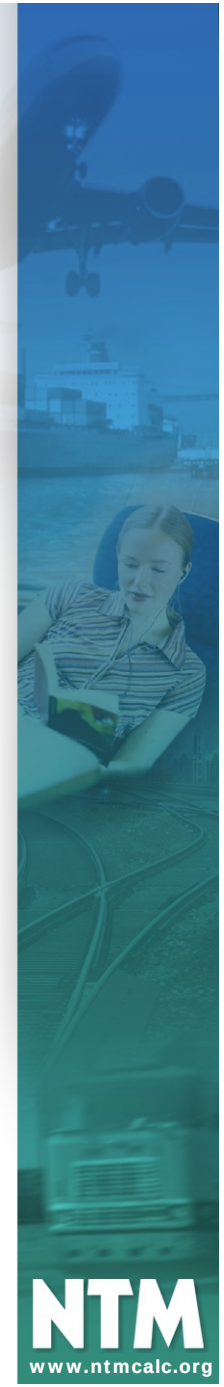


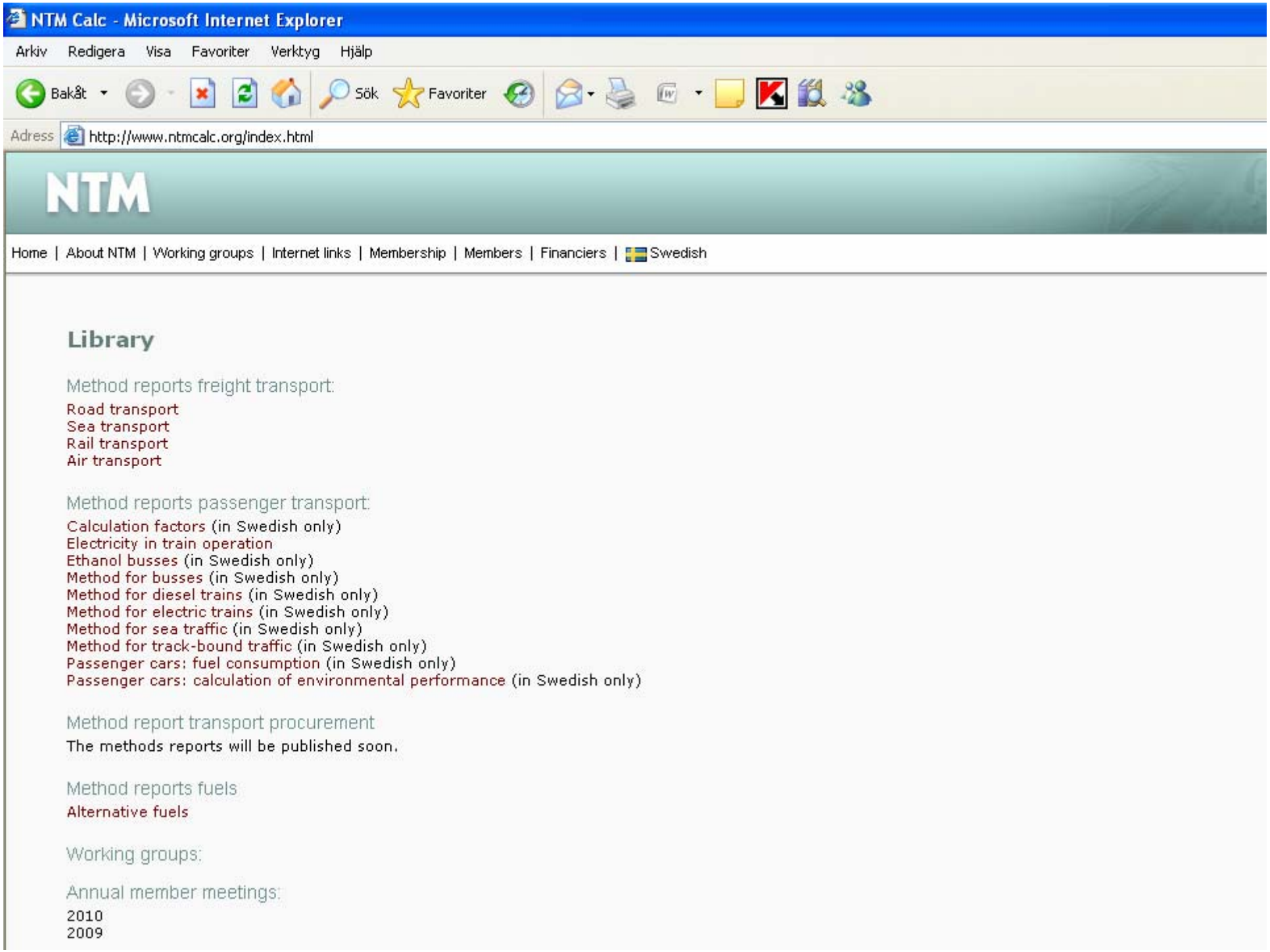


Next step – continuous improvement

- Maintenance plan towards NTMCalc 4.0

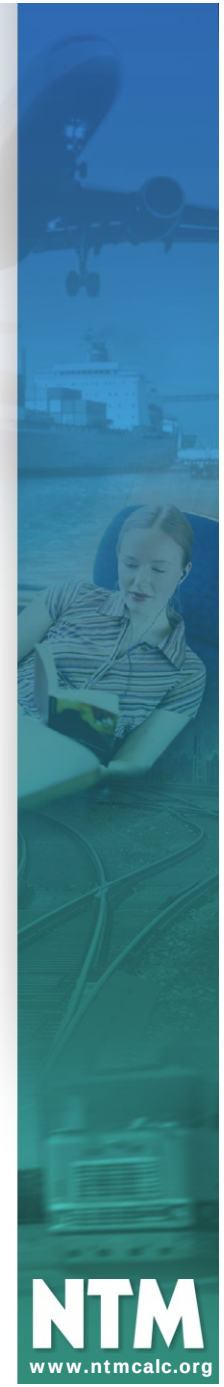
- Maintenance organization and resources
- ”Stability” focus
- API/webservice/database
- Aligning with standards (CEN, ISO 14025, GHG-protocol and coming legal requirements)
- Routing and distances
- Model and operational data
- Various converters
- Other issues




NTM Calc - Microsoft Internet Explorer
Arkiv Redigera Visa Favoriter Verktyg Hjälp
Bakåt
Sök
Favoriter
Adress
http://www.ntmcalc.org/index.html
NTM
Home | About NTM | Working groups | Internet links | Membership | Members | Financiers | Swedish
Library
Method reports freight transport:
Road transport
Sea transport
Rail transport
Air transport
Method reports passenger transport:
Calculation factors (in Swedish only)
Electricity in train operation
Ethanol busses (in Swedish only)
Method for busses (in Swedish only)
Method for diesel trains (in Swedish only)
Method for electric trains (in Swedish only)
Method for sea traffic (in Swedish only)
Method for track-bound traffic (in Swedish only)
Passenger cars: fuel consumption (in Swedish only)
Passenger cars: calculation of environmental performance (in Swedish only)
Method report transport procurement
The methods reports will be published soon.
Method reports fuels
Alternative fuels
Working groups:
Annual member meetings:
2010
2009

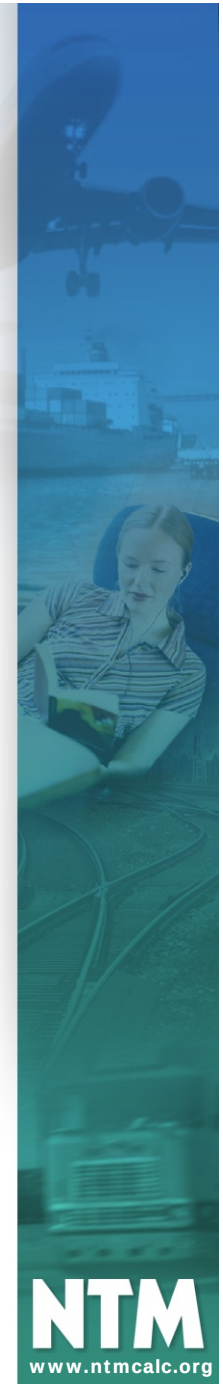
Environmental performance assessment

Methodology	Standards	Freight	Travel
	CEN	Goods	Passengers
	ISO 14 025	Road	Road
	PCR/EPD	Rail	Rail
	GHG protocol	Sea	Sea
	Legal	Air	Air
		Fuels	Fuels
		Infrastructure	Infrastructure
		Vehicle/vessel	Vehicle/vessel



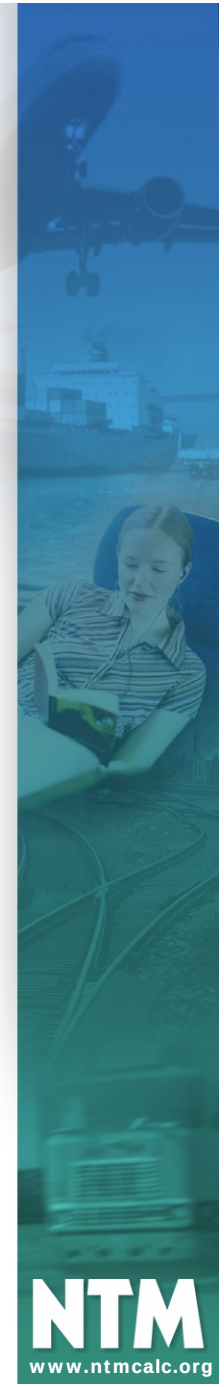
Assessment of performance

1. Determine scope of calculation
2. Establishing relevant system boundary
3. Determine allocation principles
4. Define the system to analyze
5. Capturing and calculating data
6. Assess total emissions
7. Assess relative emissions
8. Sensitive analysis



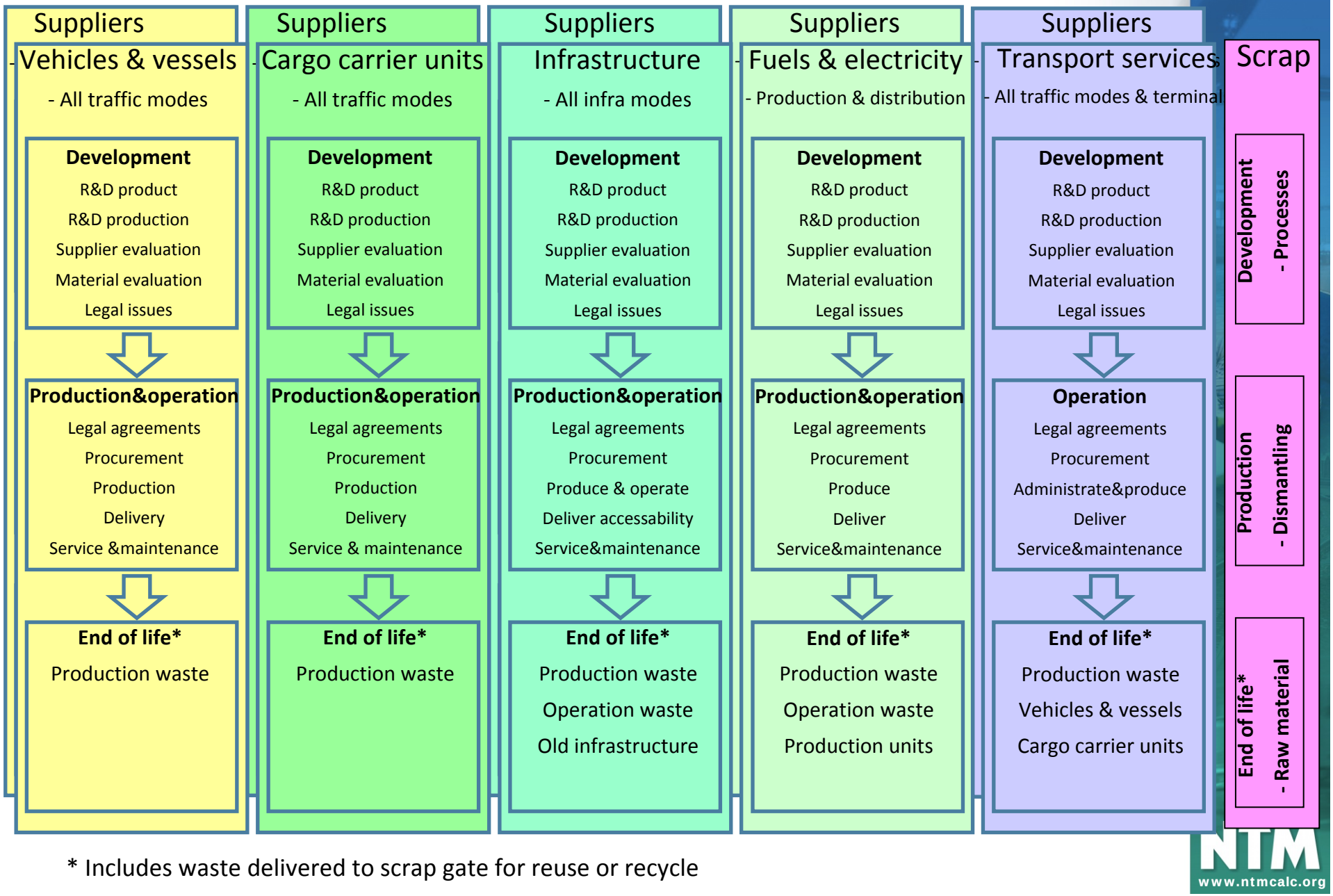
1. Determine scope

- Objective of assessment (periodical report or improvement targets)
- CO_2 or CO_2 e (GHG) and other emissions?
- Supply chain/product or company/organisation



2. Establish relevant system boundaries

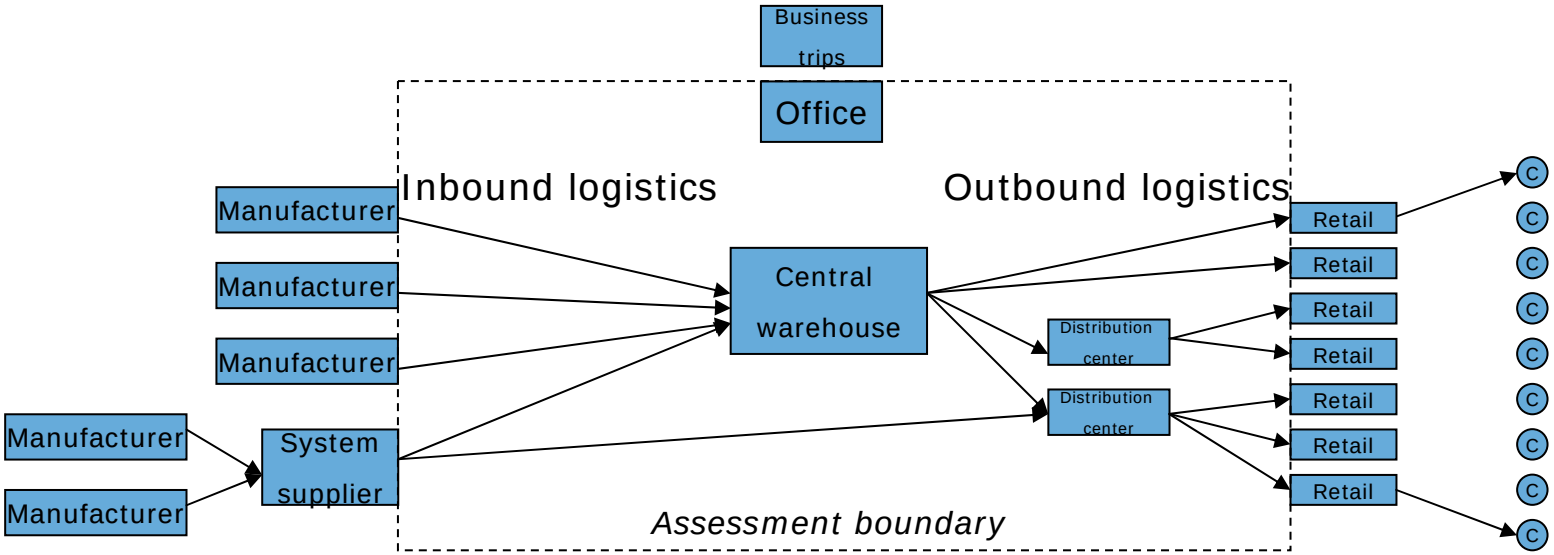
- From cradle to grave



* Includes waste delivered to scrap gate for reuse or recycle

4. Define the system to analyze

1. Dedicated or Shared transport services
2. Type of vehicle or vessel
3. Load factors
4. Total fuel consumption (TFC = FC_{MAIN} + FC_{AUX})
5. Fuel quality (cc and electricity)



Dedicated and shared transport system

Shared transport systems

Ferry line systems

Mail distribution system

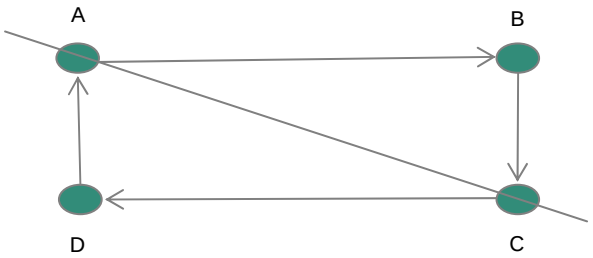
Container transport system(leg)

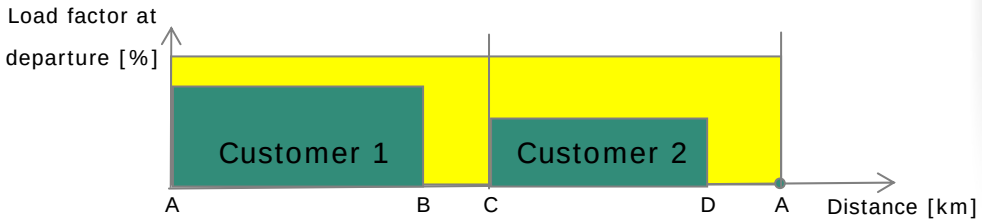
Parcel distribution system

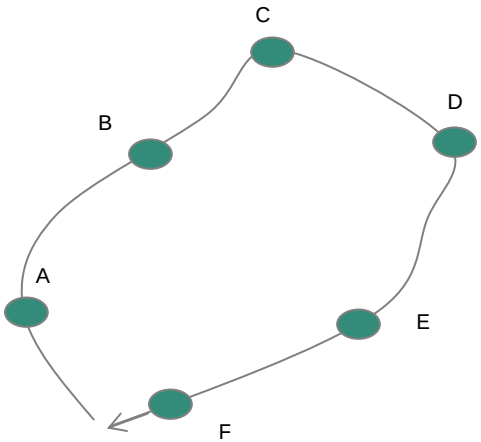
Air transport systems

Railway transport systems

Dedicated transport systems

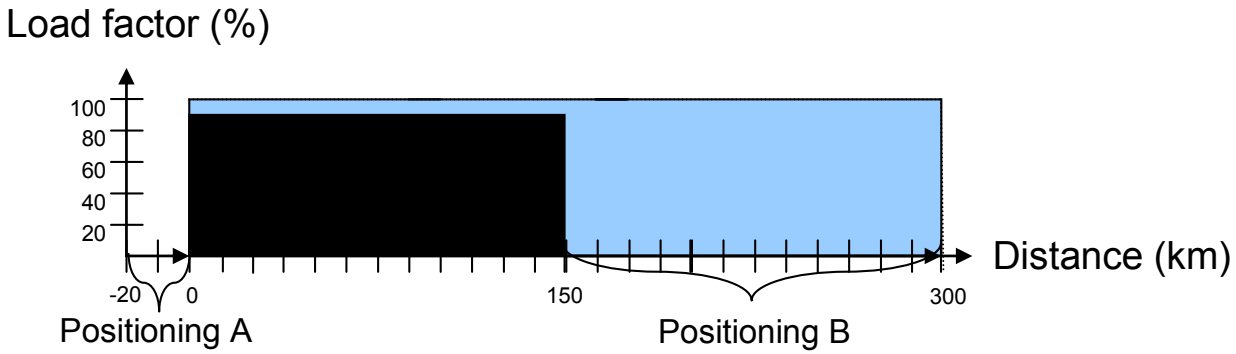






$$\text{Allocation} = \frac{\text{Total energy use/emissions}}{\text{Total customers transport work or number of mail etc}}$$

Load factor



Vehicle/vessel degree of utilisation

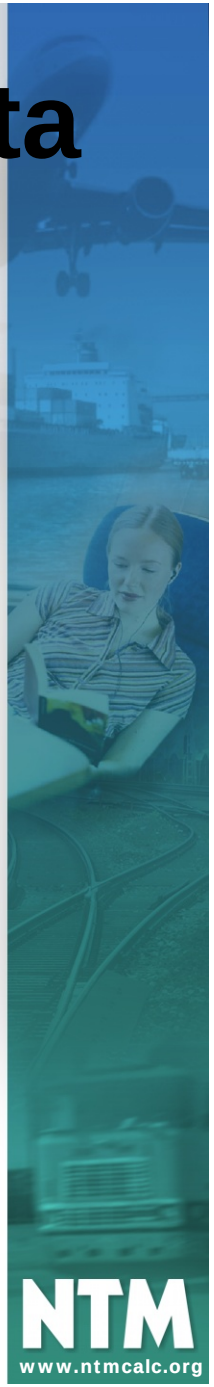
Vehicle/vessel maximum degree of utilisation

$\frac{\text{Vehicle/vessel degree of utilisation}}{\text{Vehicle/vessel maximum degree of utilisation}} = \eta$ = Ratio is the degree of utilisation

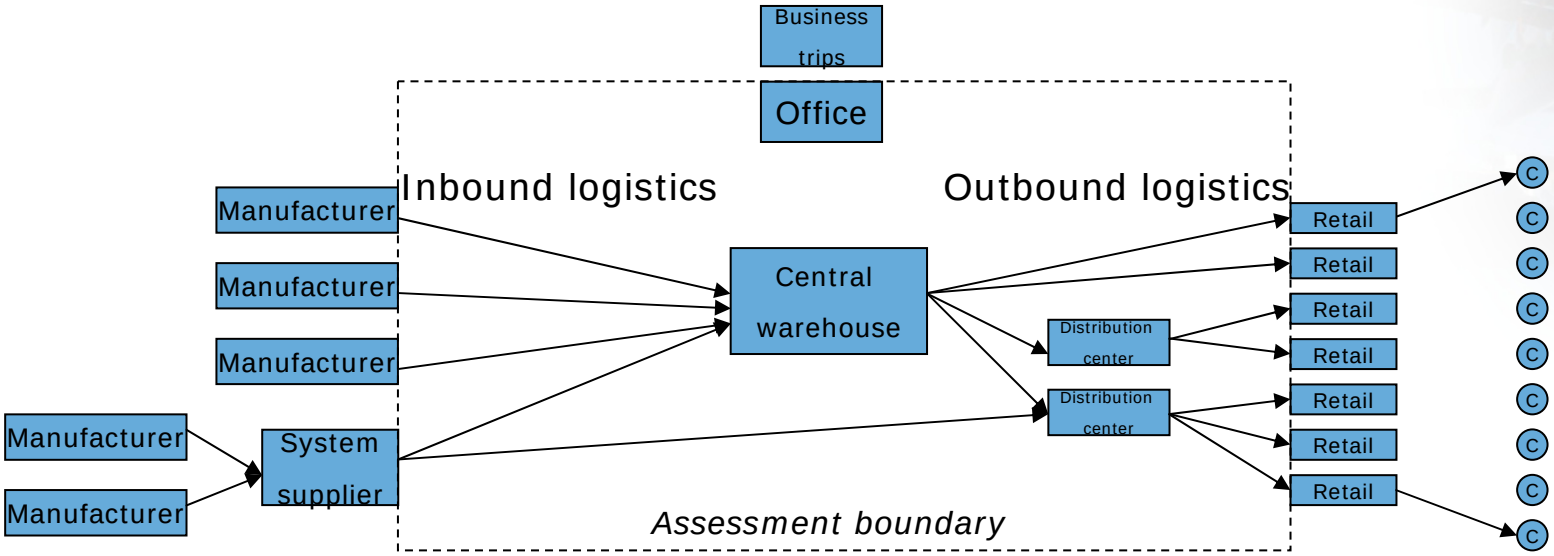
5. Capturing and calculating data

- Real data or model data?
  - Handbook for emission factors
  - Piano
  - EEDI
  - UIC
  - etc

Transport resources	Own resources	External resources
”Dedicated”		
”Shared”		



A supply chain example



Key findings (based on 10 kg of food)

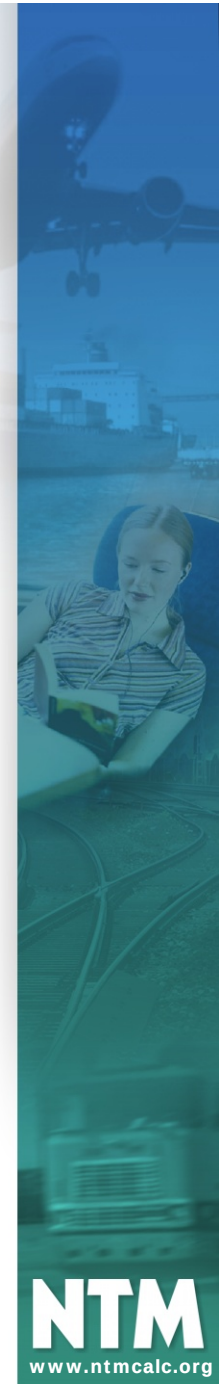
From manufacturer to retail; 0.5 kg CO_2e

From retail to home by car; 1 kg CO_2e

A supply chain example

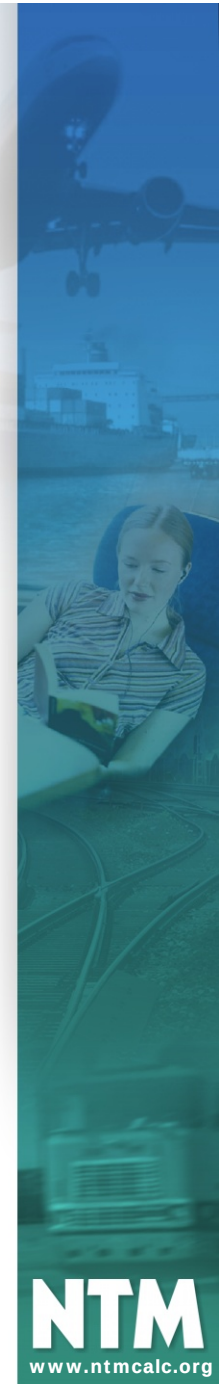
Primary production	CO2e [kg/kg]	Total weight [kg]	Total GHG [kg]
Milk	0,85	4	3,4
Potato	0,1	2	0,2
Bread	0,8	1	0,8
Beef	23	1	23
Ham	4,2	1	4,2
Chicken	1,4	1	1,4
Total		10	33

10% waste in SC	Potential GHG [kg]	GHG emissions [kg]
10%	33	3,3



7. Relative emissions

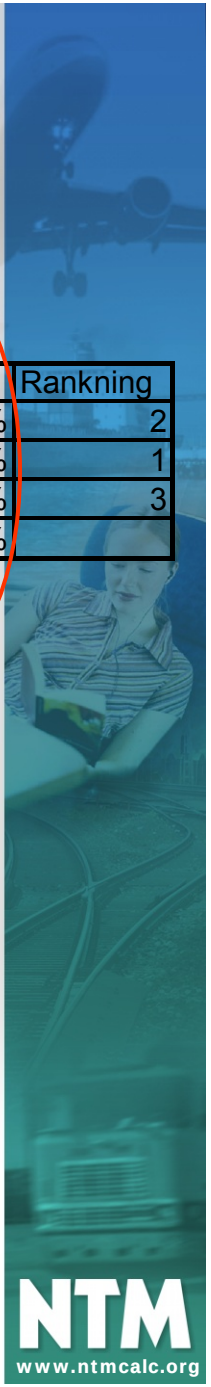
- Absolute numbers
- Relative numbers



8. Sensitive analysis

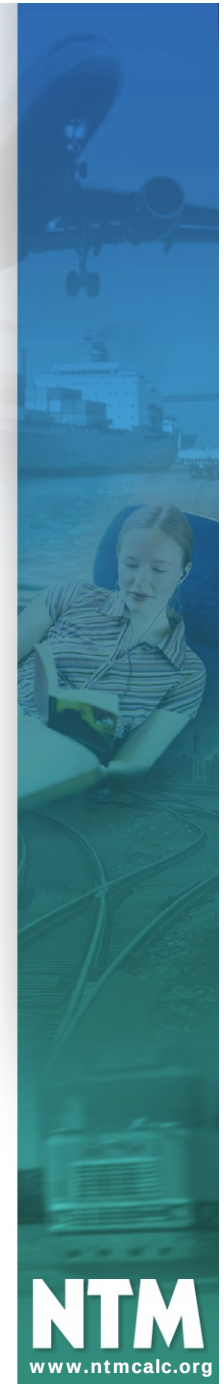
(Do we want to hear this?)

Länk		Från	Till	MAX	MIN	Genomsnitt	(+/-)	(+/-) [%]	Rankning
1	Bil i Stockholm	Bro	Tomteboda	36	13	24	12	48%	2
2	Järnväg	Tomteboda	Alvesta	293	53	173	120	69%	1
3	Bil i Småland	Alvesta	Växjö	16	7	11	4	39%	3
	Summa			344	73	208	136	65%	



Findings and conclusions

- Minimum system boundary
- Measure what you can/want to improve
- Make other factors constant
- Be transparent about uncertainty



Questions?

info@ntmcalc.org