INTERACTION
Reducing energy use in freight transportation
Final report

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Contents

Project information sheet

Name of the project	: INTERACTION *International Transport and Energy Reduction Action*
Project number	: EIE/06/140
Consortium partners	: Buck Consultants International (coordinator) (NL) SenterNovem (NL) EVO (NL) Motiva (FIN) WSP Finland (FIN) CRES (GR) Trademco (GR) Berliner Energieagentur (D) Baltic Energy Forum (Baltic Sea Area) CONTE (CZ) Association of Bulgarian Energy Agencies (BUL)
Coordinator details	: Buck Consultants International Johan Beukema +31 24 3790222 Johan.beukema@bciglobal.com
Project website	: www.eu-interaction.net
Project duration	: October 2006 – September 2008
Indication of results	: - 100 companies actively participating in energy reduction in freight transportation. - Combining cost reduction and energy savings. - Development of Good Practice measures database. - Creating a platform for future initiatives on national and EU levels.

Summary

INTERACTION stands for International Transport and Energy Reduction Action. The project was started October 2006 and ran until October 2008. The objective of the project was to identify measures to realize energy reduction in freight transportation within companies/organizations with significant transportation flows.

The consortium responsible for carrying out the project was build around strong energy agencies and specialized consultancies, supported by a Shippers Council. The project was carried out in Finland, Germany, The Netherlands, Greece, Bulgaria and Czech Republic as well as the Baltic Sea Area.

In the end 100 companies were actively involved in INTERACTION. 19 branche associations committed themselves in the different countries and were the linking pin between the consortium and the individual companies. This approach was based on a previous project carried out in The Netherlands in 2005 that proved successful.
Although INTERACTION was carried out in different countries, the approach in each country was structured in the same way. At the beginning of the project a so-called Common Framework was developed stating guidelines for the different partners to carry out the actions with the companies.

After the Common Framework was developed the crucial phase of getting commitment from companies to participate actively was entered. This turned out to be more difficult then expected. Given all other priorities companies have in their supply chains, it was difficult to convince them to put effort in this exercise. In the end however, by showing successful cases, 100 companies still saw the opportunity to combine cost reduction with energy reduction in freight transportation.

The project was carried out in a variety of industries, ranging from waste management to food producers and from oil companies to wood processing companies. Also the measures implemented were varying per company and branche. Some companies focused mainly on behavorial changes through eco-driving measures whereas other focused more on implementation of new planning tools, new vehicle technologies and/or cooperation with other companies in the supply chain.

Out of all participating companies per country one winner of the national green fleet and logistics award was chosen. In the end the German transport company AFT Altmann won the European award because of the way this company realized commitment to transport efficiency throughout the whole company, from top management to truck driver.

Chapter 1 Introduction

History

Energy reduction has become a prominent topic all over the world. This was already the case when the first discussions started about the INTERACTION project set-up. At that time, early 2006, energy reduction schemes and projects were in place for e.g. the production function manufacturing companies for many years already. Also more and more the focus of policymakers was on energy reduction in households (awareness, solar energy, etc.). In the mobility field at that time also action had been initiated. However, there the focus historically has always been more on the public (people) transportation as well as on congestion reduction and not so much on the reduction of energy use.

In 2004/2005 a large publicly funded programme was set-up in The Netherlands aiming at transport and energy reduction in freight transportation. This programme was called “Branch approach Transport Reduction” and was building further on previous experiences in projects where individual companies were supported to reduce transportation movements, to shift to alternative transport modes, etc. The core of the new programme was that branches of industry (e.g. metallurgic branch, carpet industry branch, etc.) were placed central in the approach. The branch associations were making an agreement with the Ministry of Transport (and/or the executive agency SenterNovem) and were functioning as the link between the programme and the individual member companies. This approach worked out very well and resulted in a large number of companies that were helped individually as well as a number of cross-company collaborative logistics projects.

At the end of 2005, when the programme duration was over SenterNovem, the Dutch energy agency and acting executive agency of the Ministry of Transport, picked up the idea to proceed with this approach on an international level. Here the idea of the INTERACTION project was born.

Partnership

When the idea was born a strong consortium was build under coordination of Buck Consultants International. The core of the consortium consisted of energy agencies across Europe. Around that a number of specialized consultancy firms have been selected to bring in the necessary knowledge and methodologies.

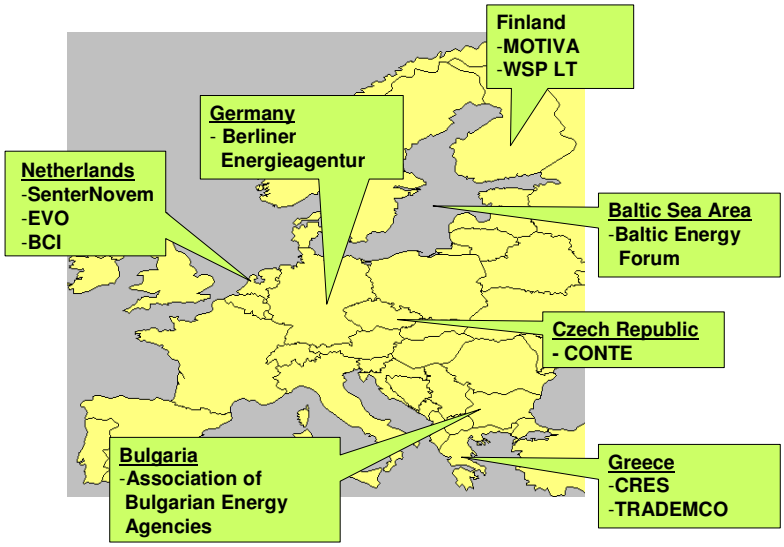
The table below introduces the consortium:

Table 1.1 INTERACTION Consortium

Participant name	Country	Type	Scope
Buck Consultants International	Netherlands	Consultancy, coordinator	Coordination EU-wide
SenterNovem	Netherlands	Energy Agency	Netherlands
EVO BV	Netherlands	Shippers Council	EU-wide (via ESC)
Centre for Renewable Energy Sources	Greece	Energy Agency	Greece
TRADEMCO	Greece	Consultancy	Greece
MOTIVA Oy	Finland	Energy Agency	Finland
WSP Finland	Finland	Consultancy	Finland
CONTE Spol SRO	Czech Republic	Consultancy	Czech Republic
Baltic Energy Forum	Germany/Baltics	Energy Forum	Baltic Sea area
Association of the Bulgarian Energy Agencies	Bulgaria	Energy Agency	Bulgaria
Berliner Energieagentur GmbH	Germany	Energy Agency	Germany

The map below shows the spread over Europe:

Figure 1.1 European spread



The consortium is a good representation of Europe in the sense that Western, Eastern and Southern European countries are included. Of course some main transport-related countries were not covered directly such as France and the United Kingdom. The choice was deliberately made to keep the project relatively small in terms of number of countries and partners to be able to focus on realizing results and not to spend too much time on coordination and communication. The countries not included in the approach were still not disregarded as several presentations have been given to audiences in e.g. France, UK and Belgium.

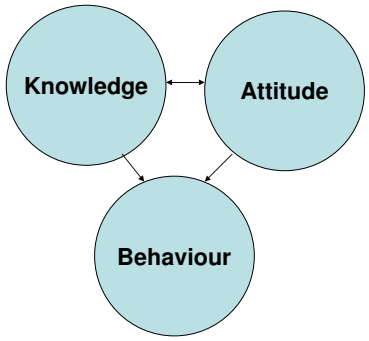
The objectives

As stated in the project plan the *target group* of project were *businesses*. In this case: companies and/or groups of companies that act as shippers (in logistics chains). After all, these companies set the success of an approach towards reducing energy use in freight transport, since shippers:

- Determine the demand for transport (together with consumers).
- Determine transport strategies, logistics structures, etc..
- Are the ones that will profit from cost reduction by means of energy reduction.

The INTERACTION project has been aiming at results in three perspectives:

Figure 1.2 Results perspectives



The consortium wanted to extend the ***knowledge*** of branches, companies and other public and private stakeholders regarding the opportunities available to reduce energy use in freight transport. An important subject in that respect was e.g. the awareness that this is not just a subject for transportation companies only. Also here it has been important to show companies that this is not only about a "green society" but also about direct logistics cost reduction and/or profit optimization. So, besides creating knowledge also the ***attitudes*** of companies, logistics managers, branch managers, etc. was being influenced by the project. In the end the objective was of course also to really change ***behaviour***: to see companies not only identify but also implement measures that really reduce energy use in freight transportation in practice.

The journey

The INTERACTION project officially started in October 2006 and ran until October 2008. In these two years 100 companies have been actively involved in the identification and partial implementation of measures. Many more companies have been informed about methodologies, opportunities, best practice results, etc.

In this report a summary is provided of the journey that has been undertaken in two years of INTERACTION.

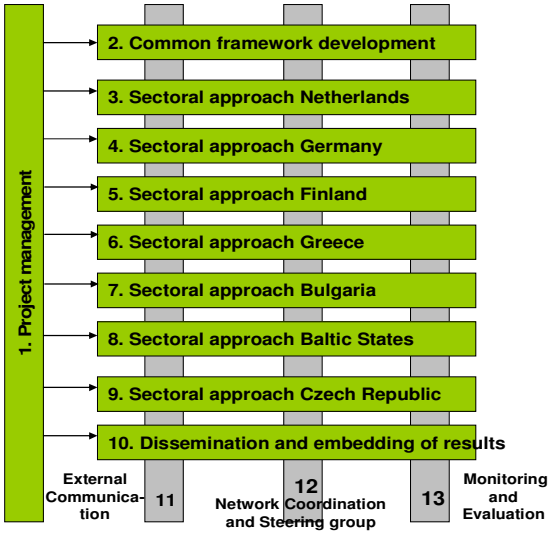
Chapter 2 Approach

2.1 Workplan

The project was divided into a set of work packages of two types:

- General work packages; carried out at EU level, aiming e.g. at project management, communication & dissemination, etc.
- Country work packages; coordinated by the partners per country and aiming at carrying out the INTERACTION activities in the participating countries.

Figure 2.1 Workplan



2.2 Common framework

As mentioned in the previous chapter the approach for INTERACTION was founded on the branch approach as developed in The Netherlands in 2004/2005. In order to tailor this approach to the context of the international project and also to ensure that all partners had a clear guideline for how to approach this subject the first step in the project has been to develop a Common Framework.

The common framework offers good guidance on engaging sectoral organisations (sectoral approach) and the implementation process of efficiency measures in freight transport. Not only to the partners of INTERACTION, yet to any (national) body (i.e. energy agency, region, employer association) that is considering an effective way of realizing cost and energy reduction in freight transport.

The common framework consists of five phases. These phases are:

1 National Strategy Plan
2 Creating Awareness
3 Selection of Industries and companies
4 Identification of measures
5 Embedding and dissemination

Activities and deliverables of each phase are explained in the following paragraphs.

1 National Strategy Plan

Deliverables		Effects
1	National Strategy Plan, including actors to involve, preliminary selection of industry (sector) associations, measures and criteria for the national 'Green Freight and Logistics Award'.	A clear strategy for the national sectoral approach is available, that structures the activities to follow.

Before actually starting the sectoral approach in one's country, it is important to develop a strategy plan regarding the selection of industry associations in the national (regional) situation. For instance, there might be other programs and/or actors which could be used to involve sectoral organisations or any other established networks. Also, characteristics and possibilities of the industries themselves are of major importance. You can either choose to:

- enhance the Logistic Freight Control of organisations within control of the own organisations (intracompany approach);
- enhance the Collaboration in Logistics, such as Supply Chain Cooperation and Collective Measures (***intercompany approach***).

Naturally, it is possible to combine these two approaches in your national approach. In your communications towards the industry associations, however, it is important to be clear about what type of industry projects you are after.
Looking for industry projects that have a high reduction potential regarding kilometers and energy/CO2-emission is an important first step in the national sectoral approach. So, start thinking about what types of measures you would like to focus on in the industry projects. Three levels of efficiency can be distinguished:

Level	Effect
Goods efficiency	more product or kg/m3
Logistics efficiency	less km/product or kg
Transport efficiency	less fuel/km

A further selection of sectors of industries can be made on criteria such as transport volumes, openness towards change, experience within sectors of industry regarding transport efficiency.

Implementing a National 'Green Freight and Logistics Award' is a useful way of stimulating industry associations as well as companies to be active in the field of energy efficiency and sustainability. Already start thinking about criteria, such as innovativeness, energy/cost reduction and possibilities for transposing and scaling-up.

2 Creating awareness

Deliverables		Effects
2.1	Communication products for creating awareness	Communication products are available to support an effective and efficient communication
2.2	Communication activities implemented	Chosen actors are willing to participate

Creating awareness is important for finding industry associations and companies that are willing to participate in the project, therefore communication products need to be developed and distributed tot relevant actors. We recommend distinguishing between two types of target groups, and consequently, developing at least to promotional papers/leaflets:

1 Leaflet about the sectoral approach in general, directed at Ministries and other policymakers and industry associations, ***to inform and generate support***;
2 Leaflet with in-depth information, potential results and gains, process, time schedule, etc. directed at the industry association and companies, ***to make them actually participate in the project***.

When available and appropriate use other media as well (electronic newsletters, professional magazines, network groups, events and meetings, etc.).

3 Selection of industries

Deliverables	Effects
3.1 Lead list with all contacts	Possible cross-chain connections can be identified, overview of possibilities is available
3.2 Intake forms filled out	Final list of highly interested industry associations and their characteristics (transport volumes, type of goods, number and type of member companies, etc.)
3.3 A number of industry projects are formulated - including signed letters of commitment from these industry associations	Industry associations are committed to start an industry project ***and to communicate results among their members***
3.4 A number of watching industries have been selected	Industry associations are committed to start an industry project after the successful completion of the previous industry projects

The deliverables in this phase speak for themselves. It is of major importance to involve watching industries in an early stage to realise continuation of the project. These industries will be included in communication structures and will participate in workshops, resulting in a Letter of Intent at the end of the project.

For both types of industries (active and watching) the central industry association will be the primary partner to start discussions and, eventually, to make firm agreements about their participation in the project put down in a Letter of Commitment before the activities will actually start.

4 Identification of measures

Deliverables	Effects
4.1 letters of commitment are signed by participating companies company logistic profile is available	Several companies per industry project are committed to implement efficiency measures, baseline logistic situation is thoroughly described
4.2 Industry Action Plan	Common problem areas and measures for the industry are defined, communication strategy is worked out
4.3 Implementation plan per company	Each company is well-prepared and ready to start implementation
4.4 Assessments for Green Freight & Logistics Award are realised	Assessments enable to choose one winner

This phase is crucial in the sectoral approach; from now on, the implementation of measures can start and energy reduction in freight transport will be actually realised.

At the beginning of the industry project, a number of companies is convinced to actively participate in the industry project and is asked to endorse their participation in a letter of commitment. In behalf of each industry project one or several workshop(s) will be held with all interested companies to discuss common problem areas, identify potential collaboration opportunities and (common) potential measures. The results of these workshops will be put

down in a so-called Industry Action Plan, which offers guidance to the involved companies regarding common problems and common measures, yet also contains an elaborate communication plan to distribute the results within the sector and an estimation of the total reduction potential within the sector. The website www.eu-interaction.net offers detailed descriptions of best practices that can be of great help in selecting and/or developing measures which have proven to be successful within a sector of industry. In the Industry Action Plan will also be addressed the actions that industries as a whole, as a representing body, should take. For instance, think of collaboration between companies (e.g. bundling of loads, swapping of goods), international collaboration (e.g. common warehouse abroad), development of standards (e.g. clean vehicles, larger loading units), etc.

However, each company has designed its supply chain in a different way and has different experiences, and will therefore have its own, specific requirements. Therefore, each company is expected to develop and write down its own implementation plan, that will elaborate on the actions to be taken, by whom and other stakeholders to be involved, vehicles to be involved, expected impacts in cost and energy reduction, time schedule, threats and opportunities timing of action, risk factors, etc.). Again, the website www.eu-interaction.net might offer great help by means of the best practices register. This website will also present various methodologies and calculation tools such as Digiscan (available in Dutch at the time of writing only) and Chain Calculator that enable quantifying the results of each measure in a specific context.
Finally, each participating industry is asked to nominate one company for the National Green Freight & Logistics Award.

5 Embedding and dissemination

The last phase is not the final phase, but will take place throughout the project duration. As said before, the concept of watching industries is crucial to the continuation of the project. Furthermore, each participating industry and company is kindly requested to share its knowledge and experience within their own networks, whenever and as much as possible , supported with communication material. At the end of the project the Sustainable Logistics Award will be awarded tot the winner. The time and occasion should be considered with care, to generate a maximum of publicity and attention with this event.

2.3 Common Framework in practice

The Common Framework as described in this chapter has been the guideline for the national approaches as carried out in The Netherlands, Finland, Germany, Czech Republic, Greece, Bulgaria and the Baltic Sea area. Each country of course has its own context. In e.g. The Netherlands and Finland the subject of energy reduction in freight transportation has a much longer history then in Bulgaria and Czech Republic. Therefore application of the

approaches has been tailored per country. Still the Common Framework has turned out to be a very effective tool as it helped to ensure comparability between the countries, it helped partners to structure there activities and it helped in the communication around the project to external actors.

Chapter 3 Results

3.1 Effects

The main results of INTERACTION in terms of direct effects can be summarized as follows:

A 100 companies actively involved in identification of measures to reduce energy efficiency in freight transportation
B 19 branch associations committed to INTERACTION and the subject of the project
C Approximately 20 different measures studied in detail
D 5-30% reduction potential identified on the flows in scope
E On average 3-5% of logistics costs reduction potential identified
F Attention through national and European award procedures

Ad A 100 companies actively involved

The following companies were involved (Letters of Commitment were supplied to the EC in an earlier stage of the project):

Branche	*Participating companies*	
Netherlands		
Retail / Supermarkets	• Sligro • Jumbo	• Boni • Brookland Plus Products
Laundry industry	• Edelweiss Textielverzorging BV • Wilgengroep BV • Newasco Verweij	• Lips Gezondheidszorg • Rentex Floron
Building materials	• Xella • De Hamer	• Van den Bosch • Morsinkhoff
Finland		
Local Communities / Waste management	• YTV's Waste Management Department • Turku Regional Solid Waste Management Ltd. • Tampere Regional Solid Waste Management Ltd. • Municipal Solid Waste Management of Oulu	• Jätekukko Ltd. • Itä-Uudenmaan Jätehuolto Ltd. • Lappi Regional Waste management

Branche	*Participating companies*	
Commerce (Retail/wholesale)	• Onninen Ltd. • Örum Ltd.	• Wulff Oy • Munakunta
Food & Drink	• Tuoretie Ltd. • Sinebrychoff Ltd.	• Leaf Finland Ltd
Gas industry	• Gasum Ltd.	
Germany		
Food & drink	• Mc Donalds	• Der Beck GmbH
Transport	• Holthaus Internationale Transporte • AFT H. Altmann Fahrzeugtransporte GmbH • BLG Logistics Group AG & Co. KG • Glomb Container Dienst GmbH. • Alpha Group	• GVZ Bremen • Kieserling • TKD • TNT Express
Local Communities / Waste management	• Becker + Brügesch Entsorgungs GmbH • Stadt Fürth	• BSR
Bulgaria		
Woodprocessing	• Lessoplast Plc. • Alfa Wood Bulgaria S.A. • Usta Chohata	• Bran AT • Eurostyle
Metallurgy / non-ferro	• NOAC Ltd. • Bulgarian National committee of Industrial Energetics • Industrial Heat Engineering Ltd.	• Steel Met Ltd • Energy Efficient Systems Ltd
Pulp & paper	• BULHART • YURI Gagarin BT • Vasil Grozdanov EOOD	• Katerial Compact • Kostenez – HHI
Greece		
Petroleum industry	• BP Hellas S.A. • Shell Hellas S.A. • Elinoil S.A.	• Avinoil S.A. • REVOIL Greek Petroleum Co. S.A.
Transport	• ALMATRANS S.A.	• PROODOS
Local Communities / Waste management	• The Municipality of Gerakas • The Municipality of Amaroussion	• The Municipality of Athens
Natural gas industry	• DEPA	
Baltic area		
Transport	• Truckmotion Ltd. • Geis SDV GmbH • Fa. Knut Ströhmann • AS Beton GmbH & Transport	• 3E GmbH • Ruhrmann Spedition • Paulsen Gütertransporte • Adolf Hoppe

Branche	*Participating companies*	
	• Rusch GmbH	
Furniture logistics	• PÄHLER Möbel-Transport GmbH • Möbelspedition Pohlmann	• Gebersmann Möbeltransporte
Czech Republic		
Transport	• TRANS - SERVIS s.r.o. • ČSAD Hodonín, a.s. • SILO TRANS s.r.o. • SUBTERRA, a.s. • Ladislav Šiška • ČESMAD BOHEMIA • Jana Bednář – Autodoprava • VK - SPED s.r.o.	• MRUZEK-SPRINT s.r.o. • RKL OPAVA, spol. s r.o. • Ing. Josef Kroupa zasílatelství a obchod s.r.o. • DE.PO.NA Praha s.r.o. • Věra Klimentová • MYKOL spol. s r.o. • Pavlína Blažková – Autodoprava • Cvas Dopravy

These 100 companies have been guided by INTERACTION partners in creating awareness for the subject of energy reduction in freight transportation and the identification of measures in their specific situation. Some companies have started implementing (some of) the measures already during the INTERACTION duration. If so, the INTERACTION partners have provided support to that process as well.

Focus during the process with the companies have been on making clear that energy use reduction and cost reduction go hand in hand. Especially in companies where this was a new subject this turned out to be difficult in the 'acquisition' phase (*see section 3.2*). This was an issue throughout the whole project (all countries). Therefore, when acquisition took longer then expected, the coordinator has made a guideline document providing the partners with the right examples and discussion arguments to use when contacting potential companies for INTERACTION participation. This, combined with persuasion power from the partners, turned out to be successful. The result was that 100 companies committed themselves (90 was the project objective).

Ad B 19 branch organisations committed

19 branch associations have been committed to INTERACTION and the subject of the project. The table below shows the types of branchs across the countries participating in the consortium.

Table 3.1 Participating branches

Branch organisations	Countries	Number of projects
Laundry	Netherlands	1
Building materials	Netherlands	1
Wood processing	Bulgaria	1
Retail	Netherlands, Finland	2
Food and drink	Germany, Finland	2
Logistics / freight transport	Germany, Baltic area, Greece, Czech Republic	4
Waste management / local authorities	Germany, Greece, Finland	3
Metallurgy	Bulgaria	1
Pulp and paper industry	Bulgaria	1
Petroleum and gas industries	Greece	2
Wholesale	Finland	1
Total		19

The branch of logistics/freight transport is highly involved in INTERACTION for obvious and reasons. The branch is accountable for the bulk of kilometers and therefore more susceptible to energy reduction (and thus cost reduction) than other branches. In fact the transportation sector is involved in all other branch projects as well.

Other popular branches are food retailers (susceptible to consumer attitudes) and local authorities (procurement of sustainable goods and services with a focus on waste management services).

Ad C Measures studied in detail

The table below shows the measures as identified and studied in detail in the different country approaches. The measures are grouped into main categories. Per situation each measure has been specified to the companies and market situations where the measures had to be implemented.

Measure category	Measure	Countries
Modal shift	Encouraging use of railways	Bulgaria
	Encouraging use of inland shipping	Germany
Logistics	Improved tour planning	The Netherlands, Germany, Greece
	Increasing load capacity	The Netherlands, Germany, Greece
Technical solutions (vehicle and fuels)	Use of CNG, biofuels	Germany, Greece
	Procurement of EUR 5/6	Germany, Baltic area, Czech republic
	Procurement of blue tec, re-equipment to LPG	Baltic area
Organisation/ process	Consolidation of shipments to specific geographies, types of customers, etc.	The Netherlands, Germany, Greece
	Enabling night distribution	The Netherlands
	Relocation of destination	Greece
	Legislation	The Netherlands
Behaviour	Ecodriving and board computers	The Netherlands, Germany, Greece, Czech republic, Finland

First of all, the table shows that within INTERACTION a wide range of measures has been implemented that cover all aspects of the transport system. Secondly, eco-driving appears to be a highly popular measure. Reason for this is that it can be relatively easily implemented without high investments and without the interference of other parties.

The intention of INTERACTION has always been to investigate a broad variety of measures as this created the opportunity to tailor the country and branch projects really to the specific requirements of the companies involved.

In general two different approaches were used within INTERACTION in identifying the relevant measures for a company or for a group of companies:

- In the first approach a company (or group of companies) has been “scanned”: the current logistics situation was assessed in order to identify improvement elements. When the improvement elements (e.g. a company has a lot of inefficient emergency shipments or a company had poor utilization of their vehicles), a broad list of potential measures was assessed in order to select those measures that were best suitable for solving the company’s problem and realize energy reduction. This assessment was done based on criteria like potential cost reduction, service impact, emission impact, etc. but also based on ease of implementation, investments required, etc.
- In the second approach a company or group of companies was already focussed on a specific solution or measure based on previous analyses outside of INTERACTION. This has e.g. been the case in the evening and night distribution project in The Netherlands where INTERACTION was used to detail out the solution and test it in practice.

It can be concluded that the first approach was more used in those countries and/or companies that were not yet very experienced in this field (e.g. Bulgaria, Czech Republic) and the second approach was more used in more developed (in the field of logistics sustainability) companies and countries.

Ad D 5-30% energy reduction potential identified

A Good Practices database was developed, based on experiences from the recent past in the Netherlands, together with additional experiences from other participating countries. The database hosts specific information about measures and (where relevant) examples of companies which have implemented the measure.

With regard to the measures implemented within INTERACTION the following reduction potentials are identified:

Table 3.2 Reduction potentials identified in INTERACTION[1]

Measure group	Measure	Description	Expected Reduction (%)
Modal shift	Encouraging use of railways Encouraging use of inland shipping	Shifting transport flows from road to alternative transport modes like rail, inland barge, short sea, etc. can lead to significant efficiencies. Apart from energy efficiency, a close analysis is required of the efficiency of the alternative mode versus road transport, in terms of costs and flexibility. Besides that, in 90% of the cases, road transport will still be necessary for pre- and end haulage. The organisation of modal shift is an action for the shippers and LSPs together.	20-50%
Logistics	Improved tour planning	Extra kilometres due to longer routes can be reduced by route planning and navigation systems, to calculate the shortest routes. It is also possible to implement traffic information of the main roads to calculate alternative routes, which saves both time and fuel-consumption. The route planning system can be applied by the shipper or the Logistic Service Provider (LSP)	2-3%
	Increasing load capacity	An increase of load per loading unit can be achieved by the size of the products or more economical packaging. New arrangements of the products optimise and new standardisation of packaging will increase the effective volumes per truck load. Shippers and Logistic Service Providers (LSP) can implement this measure.	4-15%
Technical solutions (vehicle and fuels)	Use of CNG, biofuels Procurement of EUR 5/6 Procurement of blue tec, re-equipment to LPG	Besides looking at all kinds of efficiency measures of course energy can be saved by using more effective and/or cleaner vehicles and fuels, such as Euro5-motors, the use of Bio-diesels, Natural Gas/CNG. Different options are open here which can be very interesting. The choice for cleaner vehicles and/or fuels is in hands of shippers and Logistic Service Providers.	16%

[1] Please note that within Interaction the duration of the implementation phase was not sufficient to actually measure and monitor emissions. Therefore the above mentioned figures must be considered to be a potential and not a measured and monitored actual result. More detailed figures per company can be found on the Interaction website though the Best Practices database

		Often old energy intensive trucks are replaced with new trucks with high EURO-norm label.	
Organisation/ process	Consolidation of shipment	By a changing network lay out, new transport patterns and other agreements regarding delivery can be realized. Besides a decrease of chain costs, this often leads to reduction of transport kilometers.	10-40%
	Enabling night distribution	Transportation flows today still take place mostly during daytime when there is a lot of traffic, causing inefficiencies, unsafety, congestion, etc. Shifting distribution flows to night time results directly into less kilometers driven (higher utilization), less emissions and energy use and higher road safety. To make e.g. night deliveries to supermarkets possible local legislation needs to be adjusted.	Dependent per situation *(see full report at www.eu-.interaction.net)*
	Relocation of destination	Relocation of distribution centers to more optimal locations can lead to significant less kilometers driven in the supply chain, both for incoming and outgoing transport flows. The relocation of the DCs is an interesting measure for shippers and Logistic Service Providers (LSP).	5-15%
Behaviour	Ecodriving and board computers	The truckdrivers are trained to drive more economically and safely. In some countries like Greece this measure is stimulated via a subsidy. In other countries the training sessions for drivers is made available via government resources. In addition, monitoring the fuel usage per truck/driver can create a lot of awareness and more efficient driving in the company.	5-15%

The percentages mentioned in the table are based on analyses of the 100 companies that participated in INTERACTION and are an average that should be regarded as a “reasonable estimation”. This because the figures are based partly on realization in practice and also to a large extent based on potential identified (but not yet realized). The potential results within Interaction have been benchmarked with actual measured and monitored results from other projects in the recent past to be sure that the potential effects are in line with general expectations for specific measures.

Within Interaction out of the 100 participating companies, 65 of them will actually implement the measures selected. At least 30 companies have actually started with the implementation of the measures within the project duration. Out of the registered data and the potential calculation from companies together with the consortium partners an average potential reduction of CO2 emissions has been calculated. Per company 6% to 13% of Co2 emissions can be saved. This comes down to between 20.000 and 40.000 tons of Co2 actually reduced per company per year.

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Ad E On average 3-5% of logistics costs reduction potential identified

On average a reduction potential of 3-5% of the logistics costs of the participating companies has been identified. This is much lower than the percentages mentioned in the tables below where the reduction potential per measures is presented. This is because these percentages are only applicable on the flows that are impacted by the implemented measure. In most cases this was just a part of the total logistics flows of a company.

Feedback from the participating companies shows that still a reduction of 3-5% of total logistics costs is a trigger for them to take action in terms of energy reduction combined with logistics optimization.

In terms of absolute cost reduction a short term logistics cost reduction of around 90.000 euro on average per company has been identified.

3.2 Process

Company acquisition

As mentioned before the critical element in INTERACTION has been the acquisition of companies to participate in the project. The process of getting the 90 companies in as targeted has taken about 6 months longer than planned for. The problems encountered were faced in each participating country. Upfront it was expected that in e.g. Bulgaria and Czech Republic convincing companies to take action in the field of energy reduction in freight transportation would be difficult. In the end it turned out to be just as difficult in e.g. Germany, Finland and The Netherlands.

Below the main issues which partners have experienced in the acquisition process when persuading companies and branches to commit to INTERACTION are presented as well as the recommendations to overcome these issues:

Shippers versus Logistics Services Providers

In some cases the industry associations and/or companies (shippers) indicated that they are using logistics service providers (LSPs) for the transportation of goods. The result of that is that the shipper has no influence on the flow of the goods. In some cases (when implementing certain measures) they are right, then it is useful to involve the LSP in the

project as well. The easiest way to do this is to have the shipper ask the LSP to get involved.

In most cases however the shipping company actually has a large influence (direct or indirect) on the transport of goods they produce or assemble. In fact they are often in control of the supply chain! For instance; the shipper tells the LSP when to deliver the goods to which address, the LSP only takes care of the physical transport given these instructions.

The right moment to involve LSPs

As said, in case the LSP indeed is the deciding actor in the chain, this party should be involved early in the process. If this is not the case, the shipper should first do analyses themselves and then, when first improvement ideas have been set-up, a discussion can be organised with the LSP in order to get their ideas on the actions that have been determined.

Confidentiality of information

Some companies indicate that they do not want to share information on their transport (or other possibly competitive information).

Arguments to use:

- The project is aiming at improving the performance of the company. Some information is required to assess what measures can be beneficial for your company.
- There are good opportunities to implement measures at a company which do not require detailed company information. For instance setting up a high level logistic information system, determining the opportunities for using cleaner vehicles, etc.
- All information provided will be handled in confidentiality by the project team. No company specific information will be used in external communication for the project.
- In some cases a Non-Disclosure Agreement has been signed.

Besides a meeting with individual companies in a number of cases it also worked out well to arrange a national workshop in which the project was explained in more detail.

Based on mainly projects carried out before in The Netherlands a list of measures was developed as input for all project partners in order to support them in communication with potential participants. This list was mainly used to illustrate in more detail what a company could expect when starting to work within the INTERACTION project.

Measure	Explanation	Energy/Cost Reduction potential	Implementation possibility[2]
Production process			
Management Information and KPI's	Setting up a system of information transparancy around the transportation/logistics process in a company. Many companies do not have such a system, causing that the management does not have any insight in potential inefficiencies. The experience turns out that by setting up even a simple Excel-based tool for monitoring specific KPI's, overall efficiency improvements of 5% can easily be reached.	5%	Shipper, LSP
Weight reduction products	For heavy products there is often a limitation of the # products that can be shipped in a truck. Often this limitation is not yet the volume limitation of the truck. If the weight per product can be reduced, more products can be shipped in one truck, leading to direct efficiencies. Weight reduction can take place through: using different materials, extracting fluids from the product and adding that only at the final destination, etc.	Up to 10%	Shipper
Size reduction products	Many products are "difficult" to transport efficiently due to their shape. Often a lot of "air" is being shipped with them, causing that relatively low volumes are shipped in one truck. This can be optimised by changing the size of the product as transported (compare e.g. empty boxes which stand upright, versus boxes that are folded into flat panels). Examples are there e.g. in furniture, metal scrap (product can be pressed together), etc.	5-10%	Shipper
More economical packaging	Packaging, especially for voluntile products, takes in a lot of space. Actions can be taken to use other materials/ways of packaging to decrease the extra volume added in a truck through packaging. Here also the standardisation of packaging and loading units throughout the supply chain and/or industries must be mentioned as a large opportunity. An example are stackable trays.	Up to 40% - stackable trays (example), 67% on return volume	Shipper
Flow of goods			
Relocation DCs	Relocation of distribution centers to more optimal locations can lead to significant less kilometers driven in the supply chain, both for incoming and outgoing transport flows.	5-15%	Shipper, LSP

Measure	Explanation	Energy/Cost Reduction potential	Implementation possibility[2]
Increase of load per loading unit	See above at size of product, packaging, etc.	4-15%	LSP, Shipper
Organisation of supply and distribution	Organisational measures are also of large potential. E.g. setting up a structure of periodic logistics discussions/reviews between shipper, LSP, supplier and or customer leads to the identification of common optimisation opportunities which during daily business times never show up. Periodic discussion, away from daily business, leads to awareness.	10%	Shipper and LSP
Modal shift	Shifting transport flows from road to alternative transport modes like rail, inland barge, short sea, etc. can lead to significant efficiencies. In terms of energy efficiency, of course a close analysis is required of the efficiency of the alternative mode versus road transport. Besides that, in 90% of the cases, road transport will still be necessary for pre- and end haulage.	>50% (in terms of road kilometers)	Shipper, LSP
Implementation of a hub-spoke structure with efficient long distance line hauls	Many companies, especially in less developed industries (from logistical perspective), ship products to customers on a dropshipment basis (individual shipments to customer planned in the transport network). Bringing more structure into this by e.g. setting up a weekly consolidated transport haul with all orders for a specific country, shipping it to a central point in that country and then have a country-specialist do the final distribution often leads to very large efficiency improvements. Besides that the transport costs overall can be reduced a lot.	15%	Shipper
Direct delivery from production facility to customer	There where product can be delivered directly to customers in an efficient way, e.g. when delivering full truck loads, this will also lead to efficiency improvements compared with using an intermediate distribution center (adding of costs and most probably extra kilometers).	15%	Shipper, (LSP)
Geographical consolidation of shipments to different customers within a region	See above at hub-spoke system.	5-25%	Shipper, LSP
Transportation			
Cooperation in sharing DC space	Setting up a common distribution center for different shippers in the same industry (or even different industries) and organising consolidated distribution as from there to the market leads to large efficiency increases. In The Netherlands this has been done a lot in the food retail market. Also projects are running now focussed on the fashion retail and the metallurgic industry. Common parameter to focus the clustering on is often the type of final destination of the product (e.g. retail stores in city centres, heavy industry in industrial	15% average	Shipper, LSP

Measure	Explanation	Energy/Cost Reduction potential	Implementation possibility[2]
	regions, etc.).		
Bundling of loads of different shippers	See above	15%	Shipper
More return cargo	Still many shippers with own transportation means, but even LSPs, drive a large share of their backhauls (from destination back to source) with no or only small loads (so empty). If at the point of destination loads can be found to fill the truck with on the backhaul this obviously leads to direct cost and kilometer savings.	Depending on share.	LSP, Shipper
Reduction of delivery frequency	Making agreements with customers to deliver with less frequency and with larger shipments per delivery leads to more efficiency. Of course not all customers accept this, but experience turns out that many companies will accept this if e.g. they get a slightly lower price or if delivery reliability is improved by this. Often you see that e.g. the North of The Netherlands (region with low density of shipments) is only delivered once per week with a full truck load instead of each day with inefficient small shipments and trucks loaded only for 25%.	4-20%	Shipper
Use of larger vehicles	In The Netherlands and other countries experiments are running with the use of Long and Heavy Vehicles. Advantage is of course that more volume can be taken in one ride. This especially has advantages in intercompany shipments or full load transport between supplier and producer. In final distribution to customer/retail this is less of an option.	10%	LSP
Use of cleaner fuel/vehicles	Besides looking at all kinds of efficiency measures of course energy can be saved by using more effective and/or cleaner vehicles and/or fuels. Different options are open here which can be very interesting.		Shipper, LSP
Monitoring of fuel usage	Monitoring the fuel usage per truck/driver can create a lot of awareness and more efficient driving in the company.	15%	LSP, Shipper
Awareness regarding sustainable fuel usage and driving behaviour (Ecodriving)	Ecodriving programmes turn out to be succesfull in creating awareness and actual change of driving behaviour.	5-15%	LSP, Shipper

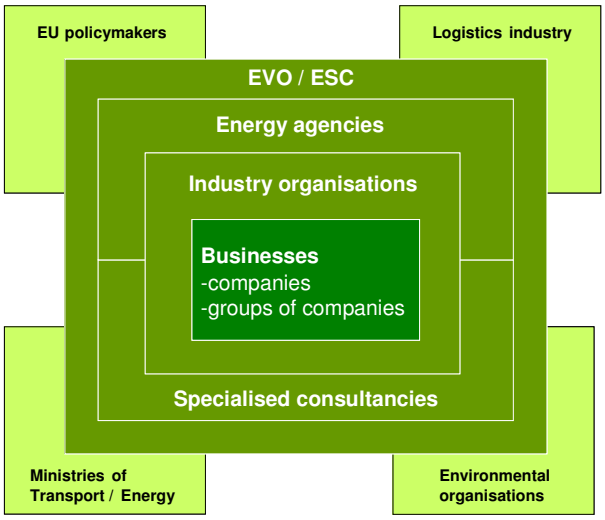
Identification and analyses process

Regarding the process of working with the companies in the identification of measures it can be concluded that the approach was different per case. This has been illustrated before through the two different approaches. A tool that is available in The Netherlands for structuring the process of scanning a company's current situation and assessing all potential measures is the Digiscan. This tool is developed based on the experience in over 250 transport efficiency scans. Dutch and German partners have used this tool and regard this as a positive contributor to the success of their projects. As the tool is only available in Dutch it was unfortunately not possible for the other partners to work with it.
In order to still support these partners a document has been compiled by the Dutch partners including the table above and clear guidelines to structure the identification and analyses phases.

Role of energy agencies and industry/branch organizations

As shown in the figure below the energy agencies and branch/industry organizations were a central element in the INTERACTION approach.

Figure 3.1 Stakeholders in INTERACTION process



Energy agencies involved in the consortium were Motiva (Finland), CRES (Greece), SenterNovem (Netherlands), Berlin Energy Agency (Germany) and the Association of Bulgarian Energy Agencies (Bulgaria). The 19 branches have been presented before.
For most of these agencies and industry organizations energy reduction in freight transportation was a relatively new subject. Through INTERACTION they have been able to develop expertise in this field and create a basis for future initiatives within their own countries.
Although this has been a learning process during the project it can be concluded that the approach has proven successful.

Chapter 4 Communication and dissemination

Besides the main focus of the project: working directly with companies to realize energy reduction in freight transportation, also a lot of effort has been put in the communication and dissemination of project results, best practices, approaches, etc. These efforts can be summarized as:

- Newsletters and brochures
- Presentations
- Workshops
- Website
- Green Freight and Logistics Awards
- Final event

During the project duration several ***newsletters*** have been made with updates on the project and practical examples of the work in progress with specific companies. The newsletters were spread around to a broad target group in each of the participating countries and on European level (companies, ministries, branch associations, energy agencies, etc.). Also ***brochures*** have been developed which the partners can use in the coming period to communicate the successes of the project and to give interested companies and organizations recommendations for setting up a project in this field of interest. The brochures have been developed in English as well as the native languages of each participating country.

Figure 4.1 Example brochure

All partners have been giving ***presentations*** on INTERACTION within their own country on conferences, seminars, etc. On European level a number of presentations have been given as well, e.g. on the START workshop in Bristol, for the French Shippers Council in Paris, for the Belgian Shippers Council in Brussels, on the Energy Summer School in France, on the Energy Conference in Macedonia, etc.

In each country one or more ***workshops*** have been organized within the scope of INTERACTION. At these workshops, often attached to a project meeting so all partners could participate, the INTERACTION team was meeting with stakeholders from the host country. The workshops were used to present practices from the project, present policy and industry practices form the host country and to discuss with the stakeholders about future developments and successful strategies.
Besides this also a workshop approach has been developed which can be used to actively involve interested people during a meeting by giving them a realistic case (*available at www.eu-interaction.net*) of a company and then discuss as a team how to solve the problems of that company. This approach has been used in a meeting with the Belgian Shippers Council and also at seminar in Utrecht in The Netherlands.

At the beginning of the project a ***website*** has been developed as communication tool. This website contains an introduction to the project, news from the project, project documents and presentations, etc. The website address is www.eu-interaction.net. Also in the coming period the website will remain live and will be updated regularly.

Figure 4.2 Website snapshot

An important element of the project has been the selection of companies who were awarded with the INTERACTION ***Green Freight and Logistics Awards***. At first each participating country has elected their national winner and then the INTERACTION Steering Group has selected the European winner. This has been direct input for the communication around the project. The national winners of the awards were:

- The Netherlands, Albert Heijn: evening and night distribution
- Greece, BP Hellas: transport efficiency and eco-driving
- Bulgaria, Lessoplast: shift to alternative fuels
- Finland, Munakunta: logistics information system and route optimization
- Germany, AFT Altmann: transport efficiency measures and eco-driving

Green Freight and Logistics award winner: AFT Altmann

A first conclusion of the Steering Group was that all candidates showed commitment to do something that combines economical and sustainability effects in a positive way. Some projects already really showed results in practice whereas others were still in the planning process, therefore the Steering Group also looked at the potential results in the coming years.

The group of experts was very positive about the way the German company implemented measures in such a way that there is a direct incentive for the employees to actively contribute to the company's goals in terms of environment and economy. AFT H. Altmann, a subsidiary of leading automobile logistics service provider ARS Altmann AG, has 300 employees (265 drivers) and a turnover of almost 40 mln Euros. The company transports around 500.000 cars each year and drives approximately 27 mln kilometres throughout Europe. Measures the company has implemented are e.g. biofuels, eco-driving training, "green" bonus systems for drivers, speed limitation on trucks, telematics system implementation and modal shift on certain routes.

AFT has earned the award through their innovation in the implementation. The company has its own trainers for eco-driving, making it possible to do the training on an ongoing basis and to monitor the effects closely. Also the company attributes part of the savings out of these measures directly to the employees. Not just 1 or 2% but a reasonable percentage of the savings, thus really motivating the drivers to change behaviour. Finally the experts state that the transferability of the measures and way of implementing to other companies is relatively high. This is because the measures are technically not that complex, can be implemented without disrupting the whole organization and still have a significant effect. For this reason AFT is mentioned as an example for other medium-sized companies, both transporters and shippers, that want to combine logistics energy use and cost reduction.
The award ceremony was on the INTERACTION final event on September 26th in Brussels.

The ***final event*** of INTERACTION was held at September 26th in Brussels. A mix of companies, national and EU public representatives, branch associations and other interested people actively participated in discussions around the theme of energy reduction in freight transportation. The seminar was moderated by Johan Beukema from Buck Consultants International and coordinator of INTERACTION. The programme contained:

- A brief overview of the INTERACTION process and results by Johan Beukema, Buck Consultants International.
  - Mr. Beukema presented the outcomes that are also stated in this report. His main conclusion was that INTERACTION showed that cost reduction and energy reduction are a good combination and he gave a glimpse on existing ideas to continue working in this respect, e.g. by setting up an "INTERACTION II" project on European level as well as by national initiatives.

- Mr. Bernd Decker from the EACI gave the EU view on the subject of energy reduction in freight transportation.
  - Mr. Decker pointed out several opportunities for companies to get support in this field, e.g. through the Marco Polo Programme. Also he made clear that within energy reduction programmes on EU level, freight transportation projects are not yet widespread. A lot of work to be done there still.
- Mr. Michael Jurriaans, member of the INTERACTION Steering Group and Programme Manager of the Dutch public programme on Sustainable Logistics.
  - He presented the headlines and best practice examples of the Dutch Programme as food for thought for both companies and policymakers. The Dutch Programme is working both on practical support to companies just like INTERACTION did, but is also developing tools that can be used by companies and supporting organizations within these types of projects (Digiscan, CO2-measurement tool, etc.).
- Mr. Mark Dijk, Managing Director of the Dutch metallurgic industry association VNMI.
  - Mr. Dijk presented the activities carried out by his member companies in the field of transport and logistics efficiency. His branch is working on this already since 2005 and his realized some significant results in terms of kilometers and CO2 emission reduction but also in terms of direct logistics costs reduction.
- Parallel session 1: The Finnish approach
  - In this session Mrs. Irmeli Mikkonen from Motiva, together with Mr. Bas van Bree of Buck Consultants International, presented the specifics of the successful INTERACTION approach in Finland. A number of learnings were presented that other organizations who start activities in this field can take with them in order to be successful.
- Parallel session 2: Interactive case study
  - In this parallel session mr. Pieter van der Bas from the Dutch Shippers Council EVO has moderated a discussion on a real-life business case. The group was asked to read the case and think of measures the company could take to get more efficiency in their logistics operation. An interesting discussion was started e.g. on the different roles of shippers and transport companies, the involvement of top management, etc.
- A presentation of the European award winner AFT Altmann Gmbh, supported by the Energy Agency Mittelfranken from Germany (a national partner of Berlin Anergy Agency).

Figure 4.3 Award presented to mr. Plankl, CEO of AFT Altmann by Mr. Jurriaans, member of the Steering Group, at the INTERACTION final conference in Brussels at September 26th 2008

Chapter 5 The future of INTERACTION

One of the main conclusions of the final event of INTERACTION was that still a lot of work has to be done in the field of energy reduction in freight transportation. Fortunately a lot of initiatives exist on regional, national and European level already.

Although the project is finished officially since end of September 2008, still a number of activities will be going on such as:

- Keeping the website live and up-to-date.
- Giving presentations on INTERACTION at conferences on national and international level.
- Spreading around the brochures that have been developed.
- Updating the database with measures and company examples.
- Applying the workshop approach as developed in e.g. France, Romania, etc.

Besides these ongoing activities there are also thoughts about a continuation in a new Europe-wide project. Discussions about this are going on at the moment. A new project will probably be build on the structure of INTERACTION but might have some more focus in terms of measures and target companies. Also the approach might be somewhat adjusted. Potential new elements that could be part of a new project are e.g.:

- Application and/or development of tools for company specific mapping and identification of measures.
- More focused knowledge transfer from experienced partners to less experienced partners.
- More attention for implementation and monitoring of effects in practice.
- Etc..

All in all there is still of lot of work to be done in this field.

We invite all companies and other organizations interested in this topic to share their experiences, views and remarks with us. We are open to interact!

On behalf of the INTERACTION consortium,

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