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CHALMERS



## **The road ahead:**

**Training and awareness raising that will encourage the freight transport sector to improve its environmental performance**

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**Summary**

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# 1 Introduction

The workshop “Training and awareness raising that will encourage the freight transport sector to improve its environmental performance” was part of the ETTAR (Environmental Technologies Training and Awareness Raising) project, funded by the European Commission under the 6<sup>th</sup> Framework Programme, and took place in Berlin on 17/18 April 2008. The workshop assembled about sixty participants representing mainly the transport and logistics industry including all transport modes (road, rail, air, sea), and other businesses as well as NGOs and independent academics.

The **core concern** of the workshop was the need of freight industry for training and awareness raising from environmental, economic and social perspectives, the triple bottom line which is now an accepted approach for organisations to demonstrate that they have strategies for sustainable growth.

The workshop contained a couple of introductory presentations and contained working groups dealing with specific issues regarding awareness raising, training and network building. The discussions encompassed all modes of freight transport: road, sea, rail and air transport. This summary will convey the results of the working groups and will not reproduce in detail the presentations given by the experts, which can be downloaded at: <http://www.ettar.eu/events/workshop3/presentations.html> .

## 2 Getting an idea of transport’s real environmental impact

### 2.1 Methodologies to calculate emissions

The workshop started with different introductory presentations about the connection between transport and environment, and more specifically about the issue of monitoring emissions as well as internalising external costs.

Mr. Sebastian Bäckström (WSP, Sweden) explained the findings and the achievements of the Network for Transport and Environment (NTM - [www.ntm.a.se](http://www.ntm.a.se)) in its search of a methodology to calculate emissions and energy utilisation of transport. Mr. Bäckström presented a new development project with the aim to provide a user-friendly IT-tool to be used by transport firms when automatically (i.e. non-manually) assessing the environmental performance of transport operations. The scope of the tool includes the emissions of vehicle, vessel, aircraft and train operations as well as fuel and electricity production and supply. While a multitude of calculation methods exists, the employment of different methods triggers very different results. Therefore, Mr. Bäckström advocated that all calculations within a specific industrial sector were to be done by one and the same methodology. To achieve a common approach, collaboration is necessary. The new approach by NTM includes the possibility of the calculator to be inter-linked via the internet with software systems already in use within transport organisations, e.g. invoice generation, track & trace, production planning and performance etc. NTM is convinced that this 'outsourcing' of the actual calculation will help the transport industry to carry out the necessary calculations more accurately, more efficiently and at a lower cost.

Mr. Ulrich Ostermayer (Deutsche Bahn, DB) gave a presentation about the EcoTransIT (Ecological Transport Information Tool) tool, which has been developed by DB in co-operation with WWF and the German IFEU institute. The EEA has tested the validity of the technology. The tool is an instrument for industry to calculate the emissions of freight transport throughout Europe. It includes all transport modes (lorry, airplane, inland water and sea ship as well as train), allows comparisons between different transport solutions and is targeted specifically at railway-based transport. The EcoTransIT methodology is also accepted by DB's competitors.

Mr. Ostermayer referred to the following reasons why the industry is interested in EcoTransIT:

1. EMAS and ISO 14001 require that the industry knows the environmental impact of their activities;
2. Exploding energy costs will increase further and thus require more energy efficient modes to be explored;
3. Corporate Social Responsibility (CSR) requires environmentally sound actions.

In the discussion about the presented calculation tools, some participants drew attention to the fact that more and more firms demand systems to calculate emissions of the transport they cause. Yet, the awareness of as well as the need for such system is not at all widespread in Europe, especially not in small and medium enterprises. Distrust of existing calculating tools and methodologies is rampant in logistics firms, which is an important reason why these are not used. Yet, this argument also often serves as an excuse for many firms to “keep waiting” for the most “excellent” methodology. Furthermore, there is a tendency to focus on the transport providers and the supply of transport services but the role of transport buyers as demanders is neglected. It is therefore not enough to focus on technologies; psychological aspects need to be taken into account, too.

It was deemed important that at least within one industrial branch the same methodology of calculation is used to prevent any distortions of results and tendencies.

## 2.2 Internalising external costs

**Mr. Huib van Essen** (CE Delft) presented the possibilities to use the external costs of transport as a basis for transport pricing. Mr. van Essen dealt with different external effects (e.g. air quality, climate change, noise, congestion). The optimal price level is represented by the marginal costs, i.e. all additional cost of additional transport activity including internal and external costs.

The external cost levels vary considerably depending on a multitude of circumstances, e.g. noisy/dirty versus low-emission vehicle, high-risk driver vs. low risk driving style, congested urban area vs. quiet rural area. The internalisation of external costs could be done via the optimisation of market conditions and the introduction of market-based instruments.

Mr. van Essen concluded that scientists have in principle done their job in laying the foundation for internalising external costs. The European Commission is now preparing a legislative proposal for a possible amendment to the European Euro-Vignette Directive.

In the discussion that followed the presentation, some participants assumed that the consistent internalisation of external costs might lead to fewer low-cost products being transported over long distances and contribute to designing a smarter way of transporting goods. The discussion, however, concluded also that the internalisation of external costs will not solve the problem. Mainly it will lead to cleaner transport, less transport of low value goods and only a little modal shift.

At any rate, the internalisation of external costs will significantly alter the cost structure of freight transport and will also generate different “**business cases**” with regard to the use of environmental technologies.

## 3 Practice examples of environmental transport solutions

Mr. **Hermann Blümel** (city government of Berlin) elaborated on the Berlin transport situation. Germany has laid down ambitious environmental targets that public transport planning in Berlin has to observe. These targets concern air quality (national NO<sub>2</sub> ceiling, national PM 2.5 ceiling), climate protection and ambient noise. Berlin has adopted Transportation

Strategies covering inter alia the urban freight sector. Urban Freight Transport has been accorded privileges, such as delivery zones, combined bus- and lorry lanes. The concrete form of these privileges has been developed in co-operation with local and city-wide round tables for commercial transport. The Strategies also include measures for a more efficient transport planning and settlement. Concerning the introduction of clean fuels, Mr. Blümel said that – according to scientific findings - the only viable clean fuel to substitute for mineral oil was Compressed Natural Gas (CNG). There is a commitment by the German gas industry to install 1000 natural gas filling stations by 2007. At present, 5,000 CNG vehicles circulate in Berlin. Yet, some types of vehicles show severe technical problems and there is rather limited interest by some car manufacturers.

Mr. **Norbert Wagener** (Wagener & Herbst Management Consultants) presented the use of freight forwarder training courses in the TRACECA (transport corridor Europe-Caucasus-Asia, Silk Road) project. One task of the project is to strengthen the freight forwarding sector in the TRACECA countries through the diffusion of training and transport of knowledge. The project shows that e-learning can facilitate this in a flexible, time and cost efficient way. E-Learning was a well-accepted method to spread knowledge. Freight forwarders made good experiences and behavioural change is visible, e.g. the increased use of intermodal transport.

Mr. **Louis Paredis** (Ford) gave a presentation about the “**Affordable Business and Cost (‘ABC’) Strategy**”, which was subsequently and gradually introduced for all Ford of Europe locations. This Strategy is aimed to facilitate compliance with Environmental Legislation, Corporate Policies and ISO 14001 Certification and results from the recognition that the logistics costs play an important role in the overall cost structure of the company. The Economist Intelligence Unit in 2007 assessed the total average logistics cost for car manufacturing in Europe to be at 17 % with a Year over Year increase expectation of 0,6 % for all car manufacturers in Europe. This cost percentage consists of all related logistics costs: material transportation, vehicle transportation, inhouse logistics, premium freight cost, labour and overhead, and administrative cost.

The ABC strategy applies to all logistics aspects: Material Logistics, Vehicle Logistics, Packaging Usage, and In-Plant Shopfloor Logistics. It is also supported by the needs of the logistics business to transform all logistics processes into lean and transparent operations thereby contributing to improving all aspects vital to logistics: quality, costs, and environmental concerns. A critical element of the ABC introduction is also the requirement and tracking of continuous improvement.

The ABC includes the shift from a decentralised planning to a more rational centralised and origin-centred (“pan-European”) supply system of goods. This allows synergies on a pan-European level to be used and an optimal vehicle utilisation. For transport operations, especially in the UK, the “greening action plan” has been ahead of the roadmap timing by using specific innovative actions and by installing the Emission Monitoring System. Critical Performance Indicators have been implemented for all process control steps.

Mr. Paredis also supported in principle the Eco-Trailer as it would help to reduce logistics costs, air pollution and traffic and through this secure the competitiveness of the European economy. However, the eco-trailer requires more testing.

More generally, Mr. Paredis held the view that legislation harmonization between EU Member States is urgently required. In view of Europe's competitive position in the global market place, innovation initiatives combining both performance efficiency and ecological improvements require leadership of logistics providers, original equipment manufacturers, governmental agencies, and, last but not least, the European Commission.

**Mrs. Sari Karpkala from UPM-Kymmene** in Finland and **Christina Wolf** of the ETTAR team gave insight into a pilot project which is being developed in the framework of the ETTAR project. The objective of this pilot project is a more environmentally rational transport route within Germany, involving the transport of office papers over a distance of

approximately 270 km by truck. Deliveries include at least one truck per day to the distribution centre at the customer's premises.

Mrs. Karppala and Ms. Wolf said that it was challenging to establish the project because it was not possible for Mrs. Karppala to simply ask a customer to be part of the project without the support of the sales and marketing departments. These departments had to be involved and it was sales who finally suggested which customer might be interested. The experience indicates that the success of the process depends very much on the individual commitment of different actors, i.e. sales managers and procurement/logistics managers on the customer's side. Furthermore, production and logistics are in fact interconnected, even if they are not managed together. This means that if logistics modes are to be changed, different aspects of production might have to be changed as well. Basically, logistics firms are not used to questioning production aspects or the production sequences of their customers. However, if there is a readiness to improve the environmental efficiency of logistics, production aspects might turn out to have quite an impact on this part of the business which is often not considered. Consequently, current logistics and production setups are to be considered in a critical way in the search for an optimal solution (economically and environmentally) in the end.

**Viviane Raddatz** from Friends of the Earth Germany - the German environmental association BUND drew attention to the fact that transport in the EU is not only growing but becomes less efficient as the same amount of goods is transported over longer distances. In other words, mobility (volume of goods transported) has remained the same while the transport performance itself has risen. The underlying reason for this trend is the global share of workspace and workforce, which leads to more links in supply chains. Ms. Raddatz pointed out, that transport was the only sector in the EU with growing CO<sub>2</sub>-Emissions, while all other sectors have reduced their emissions considerably since 1990.

While Ms. Raddatz regarded the need to adjust transport activities to more sustainable patterns as urgent, she also highlighted that in general logistics companies are not too motivated to develop more sustainable transport solutions, even though they seem to be very much aware of the sector's contribution to climate change. Ms. Raddatz mentioned that single companies, especially multinationals, have successfully teamed up with research institutes and consultants to cut their emissions and render their logistics processes more efficient. SMEs, in turn, do not have the personnel and financial means to develop such solutions. As a way of guiding particularly SMEs, Ms. Raddatz suggested the creation of Logistics Agencies modelled on the German Energy Agency. Such agencies could counsel enterprises on how to adapt their logistics operations to sustainable solutions taking into consideration their specific means and circumstances.

## **4 Information needed to change awareness in favour of sustainable transport options**

Working Groups discussed what kind of information decision makers need to be aware of the following items:

- Business Case for integrating environmental solutions into the transport activities of a logistics firm;
- Footprint of Logistics;
- Sustainable Development (general).

Also the mode in which this information should be made available to the decision makers was discussed.

## 4.1 “Future” Business Case including the internalisation of external costs

The working group came up with the following priorities:

1. The most important piece of information is **customer demand**. If there is not a critical mass of customers demanding a certain sustainable transport option, the transport enterprises will not consider taking such an option into their range of products.
2. The predicted **extent of availability of (certain) fuels** as well as the price levels concerning the different types of fuels play another major role in determining a business case.
3. The concrete form of the business case can only be known when the **cost structure** is known, i.e. to what extent external costs are internalised. This will determine the level of prices.
4. The **behaviour of competitors** is often unpredictable and thus also the motivation to strive for sustainable improvements of one’s own logistics chain. Closely linked to the competitors’ behaviour is the uncertain competitive advantage or disadvantage of the uptake of sustainable transport options induced by corporative image.

Concerning the **mode of delivery** of the information, well-targeted market studies have been mentioned to identify customer demand. This demand can also be stimulated in the medium term by awareness raising and training. Whenever good solutions are identified, it is helpful to depict the potential business impact of solutions and to provide options to leave companies a choice between different solutions.

## 4.2 Footprint of Logistics

The working group concluded that there is a great awareness about the climate footprint of transportation. Cutting CO<sub>2</sub> emissions from transport activities dominates the discussion about how to reduce the environmental impact of logistics both on the transport buyers’ as well as on transport providers’ side. Other footprints including local energy use, air pollution, accidents, congestion, etc. are generally not considered. In order to raise awareness, decision-makers need information regarding to what extent the environmental costs are already included in today’s transport prices, e.g. via taxes or infrastructure charges. This needs to be complemented by information about potential cost increases in the future driven by future legislation and regulations aiming at the internalisation of external costs.

Furthermore, the working group came to the conclusion that some of the needed information is already available and could easily be used for increasing the awareness, e.g. for traffic safety, for which available statistics on accidents, speeding tickets, working hours, etc. could be used.

1. Information about the environmental performance of different options e.g. biofuels needs to be reliable. Without an external audit, control or a label which makes different options comparable, distrust of data will prevent decision makers from taking action.
2. The information needs to be relevant for the respective firm’s own operations and needs to be suited to design future developments for the decision-makers’ own operations. Best practice examples are often believed only to work under special conditions and decision makers think that it is not possible to successfully implement them in their own company.
3. Quantitative information about the footprints alone will not be sufficient. They need to be put into context in order to make the scale of the respective firm’s own operations’ footprints clear, e.g. the equivalent amount of food which could be produced from the biomass used for producing the bio fuel used.

### **4.3 Challenges to Sustainable Development in the transport sector**

The main issues discussed in this working group were the different challenges to sustainable development in the transport sector:

1. *What kind of information do decision-makers need in order to come to more sustainable decisions?*
2. *How should this information be delivered in order to be effective?*

Knowledge and availability of technology was seen as major issue. In the end the group agreed that new environmental technologies are (theoretically) available, but that a number of major barriers limit their increased utilisation. These are:

- Lack of available information
- Limited or no sales channels
- Non-existent infrastructure

Other major barriers to sustainable development in the transport sector are:

- The fear of moving forward – perhaps the wrong direction could be taken.
- The initial cost barriers, connected with cost effectiveness – will the market (consumers) pay back?
- Decision support within one's own company

#### **Information needed – delivery of information**

The target group needs to understand the concept of Sustainable Development and have a clear definition. There are numerous definitions of sustainable development, but one clear definition should be given.

Other information of importance:

- Cost (reduction) is main driver for company management, therefore apart from Co2 emissions per km driven, there is a need to show fuel consumption;
- Show what measures can be taken, first cost-neutral options;
- External costs of transport and the supply chain;
- Undertaking a Pilot project – show that lower logistical costs and better environmental performance can be combined;
- Show possible competitive advantages of better environmental performance – clients may start demanding this.

## **5 E-learning as an instrument of training**

In reaction to the considerations outlined in the previous chapter and in fulfilment of one objective of the ETTAR project the specification of an e-learning tool to educate logistics companies and the public sector has been discussed. The e-learning tool is designed to train on the possibilities to make transport operations more sustainable. Ms. Sheila von Rimscha (Cambridge University, Programme for Industry) and Mr. Patrick Dunn (Network Learning Design Limited) introduced the general requirements that an e-learning software should fulfil to make a difference.

### **5.1 Core audience**

The core audience of an e-learning tool for sustainable transport is the procurement departments and sales departments in the logistics industry. A secondary audience is regional management, operations departments, communication managers as well as



financial and engineering managers. As for the public sector, the procurement and managerial staff concerned with transport issues would be the core target group for an e-learning software.

## **5.2 Objective of e-learning**

The objective of e-learning should be to stimulate thought about the sustainability aspects of transport including challenging existing assumptions. An e-learning programme has to be short and concise and can therefore not constitute a technical knowledge bank nor can it provide a set of solutions to the transport sector's problems. The objective of e-learning is to convince users of the importance of the issue "green transport" and thus to change the mindset rather than to merely give information.

## **5.3 Necessary qualities of an e-learning tool**

In order to have an effect and to be used in companies, the e-learning tool has to be instructive but concise enough to be used in approximately one hour, no longer. Otherwise companies would not employ the software.

Using the e-learning tool should be a stimulating experience and the software should provide information that is possibly packaged in a story, a riddle or an animation. However any games, stories or animations used to make the tool more interesting should not outbalance the pedagogic aims of the tool.

A good approach of any e-learning tool would be to provide the audience with good or best practice examples.

## **5.4 Basic approach of the e-learning tool**

Ms. von Rimscha and Mr. Dunn explained their basic approach to specifying an e-learning tool. In accordance with the criteria outlined above the team has wrapped all necessary information to be conveyed in a story reflecting standard situations in industry when it comes to environmental issues.

The story includes a clerk in the sales department of the "Speedy Logistics" company who receives a call from an important client saying that they are reviewing all logistics contracts and that in the future the sustainability plans of logistics companies are a key factor for their selection. Then the story describes the initial antagonism between the sales and the finance department of the logistics, the latter of which is keen to keep the costs down "at all costs" and is not interested in any sustainability issues.

The story then suggests arguments in order to convince the finance office. After having won over the finance department, the sales person puts up a list of issues that could help green the logistics offer of the firm. A specific issue is the monitoring of the environmental advantages. Therefore, the online tool provides the user with questions and multiple-choice answers about the most effective monitoring e.g. of the tyre pressure or of cubing out.

In the final part of the story, the sales person has to stand up to the questions of the board of managers of the logistics company who are basically supportive but enquire about certain details. This part should simulate "standard" situations and reflect arguments that are frequently used to convince people of environmental solutions.

After the board has been convinced of the approach, the sales person draws up a plan to implement the measures needed to "green" the transport. The plan should meet the following requirements: the measures must be:

- Specific,

- Measurable,
- Achievable,
- Realistic and
- Time bound

Thereafter, the plan is implemented and feedback is given by the finance office and the customer.

## **5.5 Working groups to e-learning**

While the e-learning tool as discussed above includes a general outline relevant for “greening transport operations” in general, the working groups were asked to provide some input about information needed to train on specific issues, such as intermodality, supply chain issues and training for high-level managers.

### **5.5.1 Intermodality**

The following issues have been discussed and highlighted as “ingredients” of an e-learning tool dealing with intermodality:

#### **Organisational change**

Inter-modality is difficult because the modes compete against each other and do not generally co-operate to produce the optimal mix. Even at the operational level one person ‘does’ air, and another ‘does’ land etc. and these people want to ‘push’ their solutions – there are financial rewards for this. So it might be necessary to break up current organisational structure and to develop interdisciplinary teams.

#### **Incentivise modal mix – change from lock in**

Different customers – different circumstances, needs and preferences: In one example the time element decides which mode is best, thus different modes are not competing but cost (profit) and time are the main factors, not the environment. In other cases, other factors are decisive.

There is a need to incentivise the greener options especially as part of a mix. People are locked into a single mode because they know it best and are confident about it – so we need to stimulate them out of that single mode approach.

#### **Influence the customer**

Customers will be a driving factor but suppliers can also offer solutions and be proactive. Sales people could be encouraged to offer more sustainable options and alternatives to encourage the customer. For example, does the customer really need a product the following day or in two days (this will mean air), or would a week or two weeks be also sufficient. Options are normally not presented in the product portfolio – for example shipping could be cheaper than air but it may not be offered.

#### **Influence producers and transport companies**

Production is also a factor when producers are located in remote areas or using materials from many different places which have to be brought together. Logistics are only one part of the chain. Logistics providers can also inform producers as to the impact of their location, systems etc. to help them rationalise their transport needs.

Providers can also influence the transport companies they work with – e.g. offer to cooperate with a trucking company to help them change their fleet, fuel, methods etc. There could be incentives from the logistics provider to smaller transport companies in particular who want to keep their custom. The burden needs to be shared across the whole chain – one (e.g. logistics) cannot take the whole hit.

### **5.5.2 Supply chain issues**

Another working group dealt with the issues relevant for supply chain management.

#### **Data**

An old maxim of supply chain management is to “exchange inventory with information”. Exchange of information across the supply chain is critical to achieving environmental improvement and to avoid sub-optimisation. Performance must be visible.

This means providing information on how to collect supply chain data and which data is required. **Key Performance Indicators (KPIs)** may not be understood, gathered or used by all participants across a chain – this basic information is critical, since “what gets measured, gets managed”. Determination of best practices and benchmarking are possible only if this data is available, therefore KPIs should be addressed in the e-learning. Much emphasis is placed on presenting “good” or “best” practices, but more may be learned by considering “bad” practices, demonstrating how it can be improved.

Data that impacts others must be shared and shared early. For example, packaging volume and shape can determine load factor efficiency, “empty = waste”, but the packaging is decided by the product designer or the marketing personnel. “Design for environment (DfE)” is an approach that can address the product life cycle impacts, with “Design for manufacturing” an approach to achieve efficient product manufacturing, but “**Design for distribution**” seems not to be well developed. Such a concept should be introduced in the tool. Information may already be known to some actors, but not shared because it is not considered relevant. For example, the weight of goods may be transferred, but it may be the volume that determines load efficiency. Co-operation between actors should be promoted and the question of distributing costs and benefits along the chain considered. However, a word of warning was sounded: such exchange of data may be seen as anti-competitive.

#### **True Cost Assessment**

Surveys have shown that the true costs of supply chain logistics are often underestimated. The full costs of logistics must be known throughout an organisation. An example was cited of a sub-assembly being out-sourced because the manufacturing cost was lower, but without consideration of the logistics costs. The combination of logistics and external manufacturing costs were actually greater than in-house manufacture. Profit & loss and sustainability should be linked to construct a win/win situation.

#### **Supply chain fundamentals**

The tool should introduce the basics of supply chain management: inter alia definition of boundaries of the chain, identification of key actors in a typical supply chain, power balance in the chain, identity of main drivers, and the scope of influence by each actor.

### **5.5.3 High level managers**

The third working group dealt with e-learning material oriented at high-level managers. The discussion in the group started with some basic assumptions mainly addressing how high-level managers “think and decide”.

## **Basic assumptions**

First of all, high level managers are:

- Cost and profit driven
- Pragmatic and short-term oriented

The **time-frame** they are thinking in is 3 to 4 years, 5 years maximum. Their mind-set is not oriented toward the longer term, as in most companies issues have to be solved in a much shorter time-frame. High-level managers do not have much time to be involved in new ideas. Issues must be urgent in order for them to really act.

A new issue must become a *priority for them*. High-level managers look intensely at their competitors, looking at what they are doing and whether they are ahead of them.

Another important issue is client perception and shareholders perception. What are they thinking and what are their wishes.

## **What are the key messages?**

When trying to convince high-level managers of the need of change, the message should include the following contents:

- Our solution is saving costs tomorrow
- One/more competitors have started early action
- The value of image → “the image of our company is at stake”
- “Cost structures will change”, but need to combine this with a message.
- Early cost reduction possible with small procedures (not necessary to go in detail)

### *Depicting solutions versus problems*

Basically, the message should contain a phrase like, “we have a problem, but already are looking for solutions to solve it”.

High-level managers should become convinced of the fact that the game in their business is changing, meaning that cost structures are changing. There will be a need to provide *indicators* for that, these could be:

- 1) there is legislation in the pipeline
- 2) development/growth of fuel prices,
- 3) Competitor A is ahead of us *and* “testing a hybrid car”
- 4) Wishes of clients: “client X and Y are looking for sustainable solutions” related to transport of their goods

## **Impacts**

The mentioned indicators will influence the business of the company. The manager will need information on:

- How operational costs will increase
- How the game is already changing for competitors
- How and why we need to get prepared.

## **6 Résumé**

The workshop has shown that the logistics industry still has a long way to go to render their businesses more environmentally friendly and to integrate sustainable options in their product portfolio. Business leaders have to be convinced that sustainable solutions are more rational in the long run than business as usual. While it might be the simplest way to stick to unsustainable solutions it will be very costly to get back to sustainable ones when external costs one day need to be internalised.

Training and awareness raising about environmental effects, the calculation of external costs and the eventual internalisation of these external costs are core pieces of information needed to help industry green their business.

E-learning tools have been discussed as well-suited instruments to spread information and to stimulate thought about sustainable options within the logistics sector, especially middle management, which is often decisive in proposing new company strategies.

The workshop has provided useful input for a specification of an e-learning tool designed to guide users through sustainable transport options. The information gathered in this workshop will be used by the ETTAR team in this specification which will be presented at the final ETTAR conference in Brussels on 9<sup>th</sup> September 2008.