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Transport and the Environment:

Barriers to the Take up of More Efficient Transport and Logistics Planning and Training and Awareness Raising Methods

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Summary

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1 Introduction

The workshop “Transport and the Environment: Barriers to the Take up of More Efficient Transport and Logistics Planning and Training and Awareness Raising Methods” was part of the ETTAR (Environmental Technologies Training and Awareness Raising) project, funded by the European Commission under the 6th Framework Programme, and took place in Prague on 24/25 January 2008. The workshop assembled about forty 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 question** of the workshop was how logistics technologies contributing to environmental improvement in the logistics sector can be promoted, especially how industrial decision makers (transport buyers, transport sellers) can be motivated to take up these technologies. A particular focus was laid on the role that awareness raising and training should play in this respect.

The workshop contained a couple of introductory presentations but was dominated by 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 mainly the results of the working groups and will not reproduce the presentations given by the experts, which can be downloaded at: http://www.ettar.eu/events/workshop2/presentations.html .

2 Workshop Presentations: Taking up more efficient transport and logistics planning and training and awareness

The workshop started with different introductory presentations about the connection between transport and environment, and more specifically the use of innovative logistics planning technologies and inter-modal transport solutions.

Mr. Andras Lukacs from the Hungarian NGO "Clean Air Action Group" concentrated on the complexity of counter-acting the environmental impact by transport. The issue involves many policies and it is thus difficult for policy makers to act in a coherent way. Mr. Lukacs said that environmental technologies were valuable tools to combat pollution caused by transport and are supported by his group. Yet, he also made clear that there are many other challenges that might hinder reduction of transport-caused pollution. These include for example wrong decisions regarding infrastructure, i.e. many new roads causing an increase in road transport; de-facto subsidisation of freight transport; lax enforcement of existing environmental and safety requirements for road freight transport. The use of optimised logistics planning technologies could also lead to an increase of freight transport when these technologies improve the convenience of certain transport modes. Mr. Lukacs expressed the wish that logistics associations become more aware of the environmental impacts of their transports and promote also the possibilities that innovative logistics technologies and inter-modal solutions offer to improve environmental performance.

The backbone of the presentations and discussions was the **supply chain** of product distribution comprising the relations between producers of goods (raw materials, intermediary products and final products), the transport companies transporting these goods, retailers and final consumers. The discussion in this workshop focused on optimised logistics planning

technology, i.e. the employment of Information and Communication Technology (ICT), and technology facilitating modal shifts.

Among the technological solutions discussed, the presentations concentrated on

- **Telematics and real time monitoring:** Telematics can contribute to a significant improvement in logistics planning. Important areas of application of this technology are e.g. inner-city traffic management with dynamic tour planning and global monitoring of shipping cargo. The global monitoring on shipping cargo for example helps to monitor cargo during the complete shipping via a GSM (Global System for Mobile Communications) tool on the container. The customer can then for example check that the container is closed during the whole transport process with an RFID (Radio Frequency Identification) control gadget.

- **Intermodal solutions**: Mr. Bernstaff (DHL) gave as an example of intermodal solutions DHL's inter-modal block train linking Travemünde (Germany) to Verona (Italy): this train contributes to shifting freight transport from road to rail and facilitates the inclusion of sea transport. DHL's targets that promote inter-modal solutions include increasing amount of trailers suitable for "huckepack" solutions (=suitable for rail and truck transport), Increasing loadability (truck, rail) and reducing empty runnings,. Yet, Mr. Bernstaff said that it is most important to put up targets (including emissions reduction via inter-modal solutions), measure them and communicate them, as there is no sense in promoting inter-modal solutions that at the end of the day do not lead to emission savings. As for the infrastructure, Mr. Bernstaff considered it important to give priority to cargo transports and to keep rail nets open for freight transport. Terminals were seen as a vital part of the national infrastructure where re-loadings should be facilitated. The intra-community maritime transport and inland waterway transport were seen as two key components of inter-modality which must provide a means of coping with the growing congestion of road and rail infrastructure and of tackling air pollution.

- **Freight village network** in the Czech Republic: The concept of freight villages, presented by Mr. Lukás Sukoup from the Czech Transport Research Centre exemplified by studies from the Czech Republic, aim at providing better access to multimodal freight transport and quality logistics services across the country. This approach would follow the thrust of the Czech Transport Policy and European strategic documents. The benefits of 'freight villages' – multi-modal transport 'nodes' providing open access for logistics operators to transfer between road and rail, and potentially water and air networks - are expected to optimise (i.e. reduce) freight flows by facilitating higher utilisation of both rail and inland waterway infrastructure.

As far as current **awareness raising activities** were concerned, Mr. Peter Franke from the Berlin Institute of Technology (TU Berlin) gave a description of the bestLog project. This project, financed by the European Commission, establishes a platform for the promotion and dissemination of good practices in logistics (see also: www.bestlog.org).. The platform today contains databases of logistics courses, logistics media and logistics awards and will soon be enriched by cases of good logistics practice. The following cases were given as examples:

- The Mercadona Case – a joint commitment to sustainability between the Spanish supermarket chain Mercadona and the transport operator for consumer goods distribution, RENFE-Freight. The project uses different transport modes, e.g. rail transport for longer distances, significantly reducing the number of trucks for transport and as a result reducing CO2 emissions.

- The Auchan Case – Auchan is a French supermarket chain that decided to make extended use of waterways (in combination with road transport) for its imports of non-food products for its hyper-markets and supermarkets.

- The Cargo Domizil Case – Cargo Domizil in Switzerland is the only privately owned and profitable operating inter-modal road/rail unit load cargo network in Europe. The basic philosophy of Cargo Domizil is to provide short haul transport by road and long haul transport by (overnight) rail for unit load cargo. It has to be said, however, that the Swiss ban on night-time truck driving (22:00 – 05:00 for trucks > 3.5 tons) is a very important policy driver for the success of this system.

During the discussion afterwards, the issue was raised that strict regulations for transport in Switzerland may lead to an increase in transport in neighbouring countries (e.g. in Austria for North-South transport). So a best practise example on national scale may not be “best-practise” on European scale.

3 Awareness Raising and Training

The central question in the workshop was how transport buyers and sellers can be motivated to use more efficient transport and logistics planning technologies. The instruments to this end were discussed in working groups, especially the part that training and awareness raising should play.

The workshop agenda contained working groups which dealt with the following questions:

- **Which link in the supply chain is the most easy to influence in order to integrate environmental technologies?**

- **Who makes the decisions regarding transport policy with transport buyers (producers of goods) and transport sellers (logistics providers) and based on which information?**

- **Which misperceptions exist with decision makers that hinder the uptake of environmental technologies and how can these misperceptions be overcome?**

- **Which instruments can be employed to overcome information gaps and misconception impeding the uptake of environmental technologies?**

3.1 The links in the supply chain which are most easy to influence in order to integrate environmental technologies

Generally, improving supply chains cannot be discussed in a general fashion. Mechanisms in supply chains differ according to the attributes of the respective products. Thus, in the working groups dealing with the question of "sensitive links" a ***"car-trading"*** and a ***"strawberry-trading"*** supply chain were discussed as examples.

3.1.1 Car supply chain

The most important part of the supply chain for cars was determined to be the **car producer** who influences the other actors in this chain quite considerably, e.g. the suppliers of the parts needed to produce the car (especially the "final" parts used directly to construct a car), distributors of the finished cars, etc. The producer naturally also makes the decision as to where the cars are produced, which also influences the supply chain, e.g. whether inter-modal transport can be used or distances can be reduced. Many companies especially impose the exact manner in which technologies are to be used in transport on other participants of the supply chain. The use of RFID is, for example, imposed in order to track the single commodity on the journey.

The **distributor/retailer** is to a high degree associated with the producer, so he does not have much power to influence supply chains.

Politicians have the power to internalise external costs via law-making and in providing infrastructure.

Technology providers have many capacities to improve the overall effect of freight transport but have to convince customers to use these technologies.

3.1.2 Fruit supply chain

This working group decided to examine the causes of emissions related to the transportation of strawberries at two stages of the supply chain – from the producers and the logistics suppliers stages. Several sources of emissions were noted for each of these stages. Then a series of solutions to reduce or eliminate these emissions were formulated and the main decision makers that relate to the implementation of these potential solutions were provided. It was considered useful to identify these particular decision makers in order to potentially influence them, through awareness raising etc.

It is clear that there are many different sources of emissions at each different stage and there are different solutions for the different sources. It is also clear that the decision-makers are not always the same and that solutions must be properly targeted.

Contrary to the car supply chain, producers and retailers (sellers) can influence the decisions of how the strawberries are transported. It is thus less clear who has a commanding position in this supply chain and one "domineering" link in the supply chain could not be established.

The producer has an important role in the supply chain as they can decide which suppliers of raw materials they choose. Retailers (sellers) can choose if they want to market regional products or rather products imported over long distances. Producer and seller, depending on their concrete relationship, make the decision regarding how the strawberries are transported (rail, road, intermodal transport, etc.).

Logistics companies are responsible for the concrete employment of certain fuel and engine technology and also determine the fashion of vehicle use. The producers and sellers can influence the logistics services via contractual clauses.

The roles of NGOs was also discussed in the working group. They can have a big role if they are objective, especially regarding awareness raising. With regard to the role of **Politics (National, European and Global),** it was felt that policy makers can build infrastructure through funding and also regarding strategy. They have a role to play in planning. There is a pressing need for them to cooperate/communicate with the market. They can also influence price differentiation and provide resources for research funding.

3.2 Decision makers regarding transport policy with transport buyers (producers of goods) and transport sellers (logistics providers) and the base of their information?

In order to convince companies to use or contract environmentally friendly transport modes and technologies, one has to know who makes the decisions with regard to transport policy in the different firms.

The participants of the workshop arrived at the conclusion that it is often not the logistics department itself but a higher level who makes the decision of adopting certain transport modes or technologies. Furthermore, it is often not really known inside the industry who makes which decisions. This differs from supply chain to supply chain and makes any "lobbying in industry" for environmental transport options quite difficult.

3.2.1 Producers of goods (Transport buyers)

As far as producers of goods (transport buyers) are concerned, the following levels regularly decide on transport issues:

- **Board of directors;**

- **Procurement department.**

The following information has been identified to be a basis for strategic decisions related to the transport policy (**level**: **board of directors**):

- Cost-related information (share prices/market share);

- Public opinion;

- Profit expectation;

- Loss/profit;

- Legislation;

- Internal sources (e.g. studies and views from the procurement department).

The procurement department focuses on the technical aspects of choosing transport options, such as lead-time/transit time, specifications of the transport defined by customers, reliability/stability/flexibility and informal contacts to transport providers.

3.2.2 Transport providers

As regards transport providers, their customers (i.e. transport buyers) via their commands decide which transport they want to buy.

Still, the transport provider can influence their customers in their choice. The DHL “green parcel” is an example of that – DHL created and offered an environmentally friendly solution to customers. As this is more expensive, it proves difficult to convince customers to use it.

The following information is needed for the transport suppliers to make their decisions on which technologies to apply (i.e. whether they might offer environmentally more advanced transport options):

- Effectiveness of the transport mode – What is the best cargo mix;

- Costs (different margins for different options), e.g. the filling of the unit, for example, makes it more profitable;

- Consumption of time (lead-time and transit time)

- Activities of competitors.

3.3 Existing misperceptions with decision makers that hinder the uptake of environmental technologies. Solutions how these misperceptions can be overcome.

The participants discussed the existing and long-lived misperceptions held by decision makers, which can lead them to choose not to use environmental technologies.

3.3.1 Producers of goods (transport buyers)

Among the misconceptions common among the **board of directors** of a transport buying firm (see above 3.2.1) are:

- Importance of Profit and Loss Calculations which do not consider external effects and costs;

- Belief that environmental solutions are not available at a reasonable price;

- Belief that large companies need to be innovative in a lot of respects but not in environmental matters.

Awareness raising and training could contribute to overcoming these misperceptions in the interest of promoting environmental technologies:

- Environmental considerations have to be integrated into the long term planning of a firm. The board of directors needs to be aware of the potentially mounting social pressure – coming from customers and policy makers - which could demand environmental criteria to be followed in transport and logistics operations. This social pressure can also contribute to forming a company's reputation and bringing about new legislation. A firm's board of directors should also be aware of the transport policy of competitors in order to not be the last one to act in the field of improving the environmental quality of their transport and logistics policy.

- Furthermore, it has to be understood that the current transport prices do not reflect external costs. Thus, in order to calculate the real impact of the transport and the costs caused, environmental concerns should be included – at least on an informal basis – in the profit and loss calculations to grasp the "real" prices. A methodology of how to do this, has been developed by the European Commission. [1]

- It is the responsibility of environmental education specialist groups and also industrial networks to demonstrate that there are good practice examples of incorporating environmentally innovative technologies in the transport solutions of a firm, which involve fair and affordable costs. Environmental pilot projects and trials should furthermore be part of the R+D activities of the firm (linkage of environmental departments to Research and Development).

As far as the misconceptions of the **procurement departments** are concerned the following have been identified:

- Modal Shifts involve a longer lead time and make transport less flexible;

- Customer-oriented transport specifications (flexibility, reliability, speed etc.) do not include environmental concerns;

- Environmental concerns are a matter of short-lived fashion and not deeply ingrained in society;

Awareness raising and training can also in this case help to overcome these misconceptions:

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[1] http://ec.europa.eu/transport/costs/handbook/doc/2008_01_15_handbook_external_cost_en.pdf (6 February 2008).

The belief that the more environmental concerns are respected, the less flexible or reliable a transport operation becomes, needs to be debunked by demonstration cases. Pilot projects in co-operation with specific customers could yield the “in-house” proof for the respective customer that environmental transport options can be as reliable and flexible as traditional options. Awareness of current policy developments at national or EU level will invalidate the impression that environmental concerns are only fashionable trends and will soon become less important.

3.3.2 Transport providers

The following misconceptions could be identified with transport providers:

- Environmental issues do not affect transport providers - financial issues are the only concern. There are targets by 2020 and these will impact on the sector.

- No transport firm, i.e. no competitor, is taking up environmental technologies already – in fact there are some examples, e.g. PUMA, DHL. And other companies are preparing.

- Driver training and other soft factors cannot make a change.

The following measures (to be induced also by awareness raising and training) can help overcome the barriers:

- The transport provider should review scheduling and possibly re-scaling the rates, according to the ‘greener’ options.

- There is a need for transport providers to know their own impact e.g. through emission reports to be delivered to the customer – (there is no emission trading in this sector).

- There is a need to inform the board of directors/CEOs in the provider companies of the customers’ requirements so that green options can be offered.

- Pilot projects should be launched – find one customer who is interested (has environmental commitments) and green their supply, then demonstrate/disseminate the results to other customers and their own board of directors/CEO.

- Need to influence the final consumer - to pressure the customer that they need to green their supplies. There is a need to let the customer know that transport is an environmental impact of theirs – not only the supplier (e.g. external aspects in ISO 14001).

3.4 Instruments to overcome information gaps and misconception impeding the uptake of environmental technologies

Two different working groups discussed information, incentives and regulations as the main instruments for the partial greening of the supply chain.

However, the results differ according to whether they concerned producers or sellers of transport. Many participants explicitly pointed to the producers as responsible for the level of emission. The first Working Group debated transport buyers whereas the second working group discussed all involved stakeholders along the supply chain.

3.4.1 1st working group

The following instruments have been identified as suitable to overcome any information gaps or misconceptions identified in the preceding passages for the groups of producers (transport buyers). The measures have been rated according to their effectiveness and their chance of being implemented.

- **Consumer pressure and upcoming legislation**

In order to establish the magnitude of the pressure of end-consumers or what it might become with regard to the environmental quality of transport, the companies could be advised to launch a public opinion survey. This survey might show in which way customers might be sensitive to environmental concerns. To observe legal developments that also concern the environmental performance of freight transport, firms could use a web-tool or intranet tool to clarify if their transport operations are in line with existing or upcoming law. These measures are both effective and easy to implement.

- **Knowledge of the competitors' strategies with regard to transport policy**

Competitors' approaches can be discussed/studied via industrial networking, reading specialist magazines and collecting sales figures. Although effective, gaining in-depth knowledge about the current strategies of competitors is quite difficult to carry out.

- **Understand the real environmental impact and the real costs of transport**

Given that many transport buyers and sellers are not aware of the external costs their transport causes, a simulation tool is needed that allows users to calculate the true costs of the supply chain.

A measurement tool could be set up including parameters and indicators to identify and estimate the environmental impact of transport operations. A declaration on the environmental impact of transport could be made obligatory. Furthermore, the reporting of environmental indicators could be made mandatory. The environmental footprint is a possible method to identify the environmental impact. The transport footprint should be included in a transport/environmental declaration of a firm.

While the simulation tool to calculate the true costs has been rated to be effective and not too difficult to implement, obligatory publishing of the environmental footprint has been rated as difficult to implement.

- **Environmental plan**

Producers (transport buyers) could and should include the necessary transport of their goods in their respective environmental plans. Concrete targets set in companies' environmental plans, would raise the company's awareness and knowledge about the effects of "their" transport and promote sustainable transport, provided that the companies comply with their own targets. Thus, it would be effective and easy to implement.

- **Joint Government/Industry action to set standard**

An industrial code of practice which sets guidelines and benchmarks regarding environmentally sound freight transport could be elaborated upon by a joint government/industry action. An "awards" system could be set up for innovative approaches/projects. This has been rated as effective and easy to implement.

3.4.2 2nd working group

The 2nd working group identified tools and instruments to support environmental technologies and rated them by effectiveness and ease of implementation. These were rated by the group in terms of effectiveness and ease of implementation on a scale from 1 – 10 with the following groupings: Effectiveness: 1,2 not good; 3-5 okay; 6,7,8 very good; 9 10 brilliant. Ease of implementation: 1,2 extremely difficult; 3 – 5 fairly difficult; 6 – 8 fairly easy; 9, 10 easy. The purpose here was to identify the most effective and easiest instruments to implement in order to use these instruments first and gain early successes.

The working group mainly looked at logistics service providers, but not exclusively – for example buyers of logistics services and technology providers were also targeted. There were five main players selected: CEOs, Key Account Managers, Buyers, Sellers and Technology Providers. These were grouped into three sections – see below.

For **Buyers and Sellers** the main instruments and their ratings can be seen in the following table. Clearly, the emissions calculator tool for routing and timing is an important solution, effective and easy to implement. Training (2 -3 hours per year) that is certified is also a worthwhile tool and, in addition, a visible CO2 emission report and clear regulatory limits would be worthwhile.

Tools for Buyers and Sellers		
Information	**Incentive**	**Directive/Regulation**
Emissions calculator for route, timing – Decision Support (rating different technologies/options) **Effectiveness 9** **Ease of implementation 9** **Total: 81**	€ bonus for CO_2 reduction **Effectiveness 9** **Ease of implementation 2** **Total: 18**	Clear Limits **Effectiveness 9** **Ease of implementation 5** **Total 45**
Service/Product label **Effectiveness 6** **Ease of implementation 3** **Total 18**		Visible CO_2 emission report, plan and comparing to targets **Effectiveness 7** **Ease of implementation 7** **Total 49**
Training certification **Effectiveness 8** **Ease of implementation 5** **Total 40**		Energy Efficiency targets **Effectiveness 5** **Ease of implementation 5** **Total 25**
[2- 3 hour training per year]		

The table below presents the results for **CEOs and Account Managers**. Clearly, benchmarking and competition case studies with a rating of 90 are very useful information tools. Networks and workshops are also useful but not very easy to implement. Financial incentives via image, marketing and fuel savings are also good instruments. In addition, environmental audits, especially in the EU and USA, are worthwhile regulatory tools. It has been discussed that the environmental management auditors should consider logistic aspects when they (senior management and directors) are being interviewed.

Tools for CEO and Key Account Manager (KAM)		
Information	**Incentive**	**Directive/Regulation**
CEO Network **Effectiveness 4** **Ease of implementation 4** **Total 16** KAM Network **Effectiveness 6** **Ease of implementation 5** **30**	Image, marketing, awards **Effectiveness 9** **Ease of implementation 5** **Total 45**	Environmental audits – use audits to ask CEO KAM if they are considering these issues. **Effectiveness 9** **Ease of implementation 4** **Total 36 Global** **Effectiveness 9** **Ease of implementation 8** **Total 72 EU and USA**
Luxury Workshop with high profile organisation (WBCSD, etc.) **Effectiveness 9** **Ease of implementation 1** **Total 9**	Fuel savings, reduction **Effectiveness 9** **Ease of implementation 5** **Total 45**	
Benchmarking, competition case studies (client is demanding it) **Effectiveness 9** **Ease of implementation 10** **Total: 90**		

The tools for **Technology Providers** were also discussed and there are several information based tools that could be worthwhile – these are mainly commercially available products such as SAP, ORACLE etc. Knowing about alternative (greener) providers and emission measurement tools is also valuable. From an incentive perspective, monetary rebates for reduced emissions were considered worthwhile.

3.5 Network Building and Training

3.5.1 Network Building: Example: develop a calculation method to estimate ecological footprint

Based on the information gaps identified in the preceding working groups, the question was raised on how an industrial network could help to fill one and more of these gaps.

One working group covered the issue of a network charged with finding a methodology to calculate the footprint that a certain mode of transport causes. Such a calculation would be vital as a starting point to improve the environmental performance of transport operation. Such a network could establish a measurement method for the transport footprint, identify and understand “driving links” (i.e. links in the supply chain that cause most emissions), set targets, and/or set up independent audits. A role-out plan for the implementation would need to be developed (time frames differ for different industries).

Members of such a network could be:

- Vehicle manufacturers;
- Transport trade associations;
- Environmental auditing specialists;
- Carriers;
- Fuel Manufacturers;
- Producers;
- Retailers;
- Policy Makers;
- NGOs.

3.5.2 Training (e-learning) as a method to promote environmental transport options

Another working group considered e-learning as one method of increasing the sector's understanding of the issues.

Objectives of e-learining

- to promote learners' understanding of why sustainable transport is an important business issue
- to increase their knowledge about which factors are most important in influencing the environmental performance of the freight transport sector
- to motivate them to explore the issue further.

Pedagogy

An e-learning course should contain references (pointers) to information sources but it should not be thought of as simply another source of information about technologies or policies, as there are already many sources of information; e-learning that consists simply of information to be read is dull. E-learning is often not completed by people who have many pressures on their time. Current research into e-learning – what works and what doesn't – indicates that e-learning needs to engage users if it is to be successful (and to be completed). Engagement is achieved by presenting material in interesting ways – e.g. scenarios where the user has to make choices, and then giving feedback to the user about the choices they make.

Target groups

There are many potential audiences but the primary ones can be characterised as

- providers of and purchasers of logistics services
- middle management (senior executives will not normally have time for an e-learning course, non-managerial staff will not normally influence purchasing decisions and some may not have access to a computer)
- medium to large companies (very small companies employing just a few drivers will normally not purchase an e-learning tool and are anyway heavily influenced by the policies of the larger companies to whom they subcontract)
- people in functions such as procurement (logistics purchasers) sales (logistics suppliers) general management, operations, finance.

Current knowledge level

- CSR/environmental specialists in larger companies already understand the issues, but knowledge in the departments listed above is low

Extent and measurement of training

- Training about environmental issues is generally categorised as 'nice to know' rather than essential, and in these situations, operational staff will often not be able to spend more than 1hr to 1.5 hours on this kind of training. 2-3 hrs per annum max.
- Testing is not necessarily an appropriate conclusion to this kind of e-learning but users will often like to have a certificate showing that they have completed the course.
- Completion of the training can be included in an individual's KPIs (Key Performance Indicator).
- May be best if the e-learning can be embedded into a face-to-face training, (blended learning.

Potential approach

- General information – soft and hard data (figures and facts)
- Solutions –Including technical and organisational measures
- Modal shifts – develop an understanding of modal shifts on emissions impacts.
- Case studies and examples
- Good to include numbers (but these become quickly out of date so relative indicators may be better, e.g. ranking solutions relative to one another
- Include a scenario involving a buyer and a seller of logistics services in which users see the consequences of certain purchasing decisions.

3.6 Launching a demonstration project to decrease transport emissions

Another working group was set up to develop a small pilot project between a transport buyer and a transport seller focusing on the decrease of negative environmental impact due to transportation. The group defined the necessary steps as follows:

Goal:: Check different ways to reduce the negative environmental impact from transports.

Objectives: 1. Describe one currently used transport leg (costs, lead-times, emission output etc.); 2. set up alternative scenarios considering modal changes, different routing, vehicle types, packaging, drivers' training, alternative fuels, incentives, lead-times, costs and emissions; 3. check ways to internalise external costs and 4. implement ideally as many options as possible.

The concrete actions from both perspectives were discussed as well as the people needed at different stages in the process. Both transport seller and transport buyer agreed that it was essential to find the internal stakeholders first. Different people can belong to those "internal stakeholders", depending on each individual company and organisational structure. A board member responsible for environment within the company for example can be such a stakeholder if he is personally convinced that environment is a value worth protecting or if he is convinced that his company could increase returns with environmental protection. In this case, he will drive environmental development and can be a strong support for the mentioned pilot project. Internal stakeholders have in common that they are promoters of environmental protection, understand the urgency to act now and have enough power inside the company to help push this issue forward. Those stakeholders should be united in companies in order to realise projects which would otherwise die due to lack of support.

Important internal stakeholders with transport buyers are: environmental department, regional logistics director, sales manager and corporate communications.

Important internal stakeholders with transport seller: Key account manager, operating branch (operative units of transport business, carrying out the transport operations) , environmental department, corporate communications.

Discussions should be taken up with all of these groups, which should then lead to a refined project proposal. Customers of the transport buyer should be contacted in order to find out whether there is an interest in the suggested project. This should be done by the environmental expert in logistics and sales people of the transport buyer together. Afterwards, the project proposal should be adapted once more to the comments and needs of the customer before finally entering into the implementation phase.

4 Conclusions

The workshop has dedicated itself to identify first approaches to improve the environmental performance of the freight transport sector, especially by awareness raising, industrial networking and training.

The following points have been deduced as summarising facts from the preceding discussions:

- Plenty of projects improving the environmental performance of freight transport can be undertaken in the existing framework, i.e. without any additional legislation or large investments, by environmentally aware and enthusiastic people;

- While there exists enough potential for environmental improvements, there is not enough motivation on the part of the logistics industry, instruments need thus to be applied to raise motivation (good practice cases, pressure from NGOs and customers, further legislation, etc.)

- Technical problems to measure the environmental impacts persist and should be tackled (e.g. the measuring of the environmental footprint); solutions to measure the impact need to be applied and the results be used as a basis to make decisions on the different transport options;

- Existing networks should be motivated; Pilot Projects play an important role to raise awareness and to spread good practice, they help do discuss issues with policy makers; also the negative lessons learnt should be disseminated,;

- Green public procurement could very much help companies to take up environmentally friendly transport solutions;

- To convince decision makers in a firm to employ environmental solutions, (approximately) cost-neutral solutions should be developed first, yet they do not provide an overall solution, as a considerable environmental improvement often requires a raise in costs;

- The issue of environmental improvement in the freight transport sector is a complex problem, which cannot be solved at once: showcases should be developed within a limited sphere;

As a consequence from these points, (voluntary) industrial networking and specific training activities can be regarded as vital instruments to promote the use of environmentally

advanced transport technology and transport modes. Thus, these activities need to be reinforced and promoted also from the side of policy makers.

The next ETTAR workshop "*The road ahead: Improved training and awareness raising for an increased usage of environmental technologies in the transport sector*" will take place on 17 and 18 April in Berlin. To continue the momentum of the discussions in Prague, ETTAR team and partners will carry out further activities, including a small pilot project on greening parts of the supply chain and the specification of a training and awareness raising tool. These pilots will be discussed and complemented during the next ETTAR workshop.