CLECAT

european organisation for forwarding and logistics

Logistics Best Practice Guide

A guide to implement best practices in logistics in order to save energy and reduce the environmental impact of logistics.

CLECAT's Best Practice Guide to save energy and reduce emissions

Preface

I. Introduction

The challenge to mitigate the consequences of human activities on the environment has become one of the major concerns characterising and influencing today's business world. The battle to preserve our environment has gained momentum over the years and is now part of the policy of a growing number of enterprises. The ongoing battle against climate change owing to GHG emissions has also come to the fore in policy and business alike. These two different yet intertwined predicaments have not failed to impact upon logistics activities, questioning some of the basic principles of this discipline. Transport services appear to be one of the biggest sources of CO_2 emissions and some of the transport emissions are also pollutants. This is however an industry, which is, on the one hand, indispensable for growth and employment and yet on the other hand has enduring difficulties freeing its dependence on fossil fuels .

This being said, logistics is not only transport: a more wide-range view on what can be done to improve the environmental performance of logistics can contribute to our industry's footprint in an area where legislation is finding it increasingly difficult to step in .

The need to decrease emissions, but also to save energy and money, should be at the heart of our companies' thinking. Luckily these needs – lessening emissions, decreasing the use of energy and saving money – are connected and may respond to the same drivers: not only the logistics service provider, but also the transport user are likely to benefit from savings that may be environmental as well as economical. There is an abundance of possibilities and many companies have already found ways to improve their business models with individual solutions, which have the potential to be developed into best practices. Their experience is the source of the best practice models that benefit and encourage others to do the same.

In other words we are not trying to re-invent the wheel in this booklet: we are trying to disseminate the best practices that we have managed to collect from different sources, and make them available to others, whether they are logistics service providers or users. Whilst this may appear a minimalist approach, we believe it can be extremely helpful in an area where sharing knowledge and know-how is crucial.

II. Aim of the exercise

1. Promoting best practice

CLECAT has therefore decided to produce a guide for companies that have the intention to implement best practices in their operations, with the aim of leading them to select the best case in their business environment, in order to achieve an improved sustainability and environmental performance in their activity. This paper compiles several of these best practice cases for companies to evaluate, apply and use.

This paper focuses to a large extent on possible savings in resources, especially in the road sector. As regards other modes of transport, their share in the modal split is much smaller, they also seem to generate less best practice examples than is the case in road transport. Whether this is the result of a lack of best practices in general, or whether CLECAT did not receive enough feedback on this point is not completely clear at the moment. We have also tried to include best practice cases that are not necessarily related to transport, they include the economical use of heating/lighting/paper, the introduction of better recycling systems or more efficient waste disposal, analysis of fuel consumption, optimised servicing, and journey management.

Best practices work properly, if people apply them on a daily basis. As stated above, this document is a living document, which will be circulated to CLECAT members once the first edition is published. The majority of best practices, described in this booklet are brief descriptions covering specifics like the aim, the time line and the costs of the relevant best practice. The Best Practice Guide is envisioned as guidance material and thus not as an exhaustive explanation or description. If more information is required the CLECAT Secretariat will be more than happy to either establish direct contact with the BP owners or provide more detailed information if already available. Additional information is also readily available on the internet: the relevant web addresses are provided beside the BP example.

As a starting point CLECAT has compiled a list in which areas best practices can be found and are useful. The general list aims at providing food for thought for new ideas and/or as incentive to report to CLECAT any positive achievements a company has developed for its business. In the sections following, one can then find the concrete best practices, divided into best practices divided into a Technical and an Organisational/Workforce section.

At the end of this document you will find a short literature review with the most relevant sources and further information.

2. Best practice is you!

We understand this exercise as a work in progress; this means we have the intention to receive what CLECAT Members (and others) think of reporting as good practice, whenever they are made aware of a positive experience.

To reiterate: this compilation has another important aim, namely promote active participation and new additions to the Best Practice Guide from the transport industry in general, and from the forwarders' community and CLECAT member companies in particular. The Best Practice Guide is a compilation that is meant to be an inspiration to others and will guarantee a wide-range appeal and publicity in exchange for information on a company's efforts to promote environmentally-friendly, sustainable transport solutions.

We therefore hope that you can also get inspired by reading the examples provided in this guide, and send us *your* best practices as soon as possible. Keep in mind: this is an ongoing exercise and a living document. Due to the nature of best practices, that are developed, refined and then possibly exchanged again, once new technology or

management improvements have been developed, this publication can never be complete or finished. Every additional best practice will make it however more complete and meaningful. Please do contribute to making it as complete as possible.

Some may see this in the light of competition. We do not believe it should be seen as in a competition between companies for the same market segment, but as a means of letting others benefit from other experiences. The addition of your best practice is a business chance, not a danger to your business. The inclusion in this compendium may result in a better or greener public image of your company, raising its profile with possible future clients.

We therefore encourage both Members and third parties to send their feedback and experiences to the CLECAT Secretariat (info@clecat.org) for possible inclusion in the next editions. A short abstract, possibly with the results of the best practice and a link, providing more information, would be enough. This only takes a few minutes and will provide your company with great visibility.

III. General areas for improvement

1. Technology

There are various improvements in the area of technology, which can benefit a company enormously. Sometimes best practices will only bring minor changes and benefits in a business process, sometimes one can make heavy investments, which although will only pay off after some/long time of usage, the savings will build up over time and be very significant. Whether the amount of money saved from new technology justifies the (sometimes big) investment in new machinery/software or whether the economic benefits of introducing new technology sometimes remain a risk, all are ideas best evaluated case by case. The environmental benefits on the other hand are often clearly noticeable, but again it often remains unclear which are the economic benefits, or even worse, which are the hindrances leading to the sad equation "good for the environment: bad for business". However, it can not be stated often enough, and the best practices shown in this document confirm this perception: many best practices that have had a positive impact on the environment are also beneficial in their economic performance. This can happen either directly, e.g. through less fuel consumption, or indirectly, e.g. because customers are looking for a CO_2 neutral transport and reward the positive efforts made by their service provider by selecting their service over and above others.

The following paragraphs are a general introduction to this section on technology and can maybe generate some further ideas in other areas.

Before starting with **evaluating the benefits** of any best practice, the company in question should define for itself what is to be considered "green" in their perception. As soon as it is clear what one wants to achieve, it is possible to research specific best practices, which best suit the company's business needs. An analysis of the company can help to see what effects one can measure directly and what can only be measured indirectly. Transport related benefits will always be indirect, if a company does not have its own fleet. It is a critical first step to take informed and intelligent decisions.

On this specific point we wish to suggest that elements of environmental best practice may be usefully introduced in the quality management of the company, even before contemplating environmental standards such as ISO 14000[1].

Just to quote some of the most common measures that are advantageous in road transport logistics, new kinds of radial **tyres** technology, with proper maintenance, can run over 100,000 kilometres on the original tread. Another option is re-treadability, which means that truck tyres are produced so that they are capable of being re-treaded two or more times with careful and observant maintenance. Not only should a company be trying to reduce waste during production, it can also recycle used tyres for energy production. After retaining re-treadable casings, burning whole tyres in cement furnaces and power stations is becoming more common overseas and particularly Australia - with tyres producing more power than coal.[2]

A company has to keep its **truck fleet** up to date, because newer trucks will for example feature the latest emissions-control technologies. With new software, companies have the possibility to continually monitor engine performance. Investment in new technologies will help reduce emissions *and* energy consumption at the same time.

Another idea would be to have primarily team-driven vehicles, which would result in fewer empty runs (by generating a lot more revenue per kilometre). For this strategy to be successful there should be no imbalance between inbound and outbound freight: this means that one of the greatest efforts should also be made to adjust the commercial policy in order to archive this result. Transportation management systems can help analyze identifying profitable/unprofitable routes.

On Route planning, please see section 3 below.

It is possible to use a weight-based calculation to determine the amount of carbon a shipment emits and then offset that through the purchase of **carbon credit**, which can be traded in certain credits exchange platforms.[3] CLECAT is closely monitoring any related activity in the EU, which would introduce a harmonized method to calculate the amount of CO_2 emissions for a specific transport mode or quantity of freight.

With the installation of **alternative energy sources**, e.g. solar photovoltaic[4], solar hot water, wind, ground source heat pump, and biomass systems, companies can save energy/heating in their office buildings as well as in their warehouses. Offices and warehouses that are built with modern eco-friendly criteria[5] can make significant cuts on the company's energy bill.

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[1] http://www.iso.org/iso/iso_14000_essentials

[2] See for example: http://findarticles.com/p/articles/mi_qa5356/is_199806/ai_n21423255/

[3] "8 steps to a greener supply chain": http://www.worldtrademag.com/Articles/Feature_Article/BNP_GUID_9-5-2006_A_10000000000000296125

[4] See also Best Practice I.3.: FedEx plans to install the largest rooftop solar-electric system in the US at its distribution hub in Woodbridge, N.J. This is the fifth solar power project for FedEx and will produce 2.42 megawatt solar power.

[5] For example: http://www.businessweekly.co.uk/2009052034974/property-and-construction/eco-friendly-warehouse-for-wine-society.html

When evaluating facilities and vehicles, **energy consumption data** can help find energy sources of energy waste, e.g. electrical equipment, which uses energy just by being in standby mode.[6] As it was noted above, the identification of a carbon footprint is an important feature for conducting any kind of 'green business'. There are companies, who can deliver such a service[7], but it would be more attractive and valuable to come to a European standard, instead of struggling with several conflicting solutions.

Environmental reporting[8] is sometimes expected from appropriate authorities in EU Member States. What looks at first sight like a bureaucratic burden, can also help identify sources where energy is wasted. The best idea is to introduce elements of environmental reporting on a voluntary basis and make it a promotional feature of the service.

Packaging reduction will inevitably lead to better economic performance, as well as being an advantage for the environment. Often packaging has already been optimized, but it everyone's experience that packing still offers ample possibilities for improvement. It is worth re-thinking the packaging policy for many products and adjust/retrofit to the newest technology.[9] It may also be worth considering this activity as an additional and innovative service that logistics service providers could propose to their customers.

Waste itself is inevitable and unavoidable, but there is always room left for **waste reduction**, which will lead to a better environmental performance as well as economic benefits through savings on waste disposal fees. Recycling is an option to enhance the environmental performance, in other words disposing/recycling items like computers, monitors, keyboards and fluorescent bulbs can save money and can also be proposed as a service to third parties.

We shall not deal with bio-fuels and additives in this section, as this is a topic that is worth a more detailed and dedicated publication. The same goes for all new vehicle related technology (hybrid, electrical, hydrogen, etc.)

2. Personnel

In the area of personnel there are various possibilities to enhance both the economic and environmental performance at the same time. Thinking of logistics the most notable and well known is **driver education and training,** which focuses on making drivers aware of fuel-efficient driving, and contributes to enhancing the safety of both driver and goods. This generates savings in the form of lower insurance premiums, less energy consumption and better use of resources.

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[6] For general energy consumption data in the transport sector in the USA, see the Transportation Energy Data Book: http://www-cta.ornl.gov/data/tedb27/Edition27_Full_Doc.pdf

[7] E.g. http://www.carbonfootprint.com/index.html: aimed at helping small businesses all over the world understand their impact on climate change

[8] See for example: http://www.globalreporting.org/NR/rdonlyres/541615B9-9392-448F-AD2A-53C38F2524DF/0/SS_LogisticsTransportation_ENG.pdf (Logistics and Transportation) or http://www.globalreporting.org/NR/rdonlyres/0F09CCFF-C378-4B5F-9944-76E24679226B/0/SS_FinancialServicesEnvironmental_ENG.pdf (environmental reporting)

[9] E.g. Wal-Mart in the US urged their suppliers to reduce packaging and conserve natural resources. Through this initiative 667.000 metric tons of CO2 will be saved. About $ 11 billion is expected in savings from a 5% reduction in 10% of the global packaging industry.

Examples of driver education measures can be found in the detailed best practices below. Some examples for driver education: teaching drivers about tyre maintenance and optimal tyre pressures etc. This contributes to lifting the current low levels of tyre maintenance and prolonging the life-cycle of tyres. Driver training programmes can give incentives to drivers who perform efficiently in achieving fuel economy through reducing idle time and keeping speed limits within a certain range: engine control modules can be used to set maximum speed limits, which again will help to diminish waste of fuel and accidents.

Offices benchmarking tools can improve the work flow. A company should calculate an ideal benchmark based on the type of office space, number of workstations and standard occupancy. As a next step benchmarking should be carried out to be tailored to the specificities of the relevant building. The tailoring allows working hours, including weekend working, to be specified for each type of office space within the building. Details of catering, vending and IT equipment and machine/computer rooms can be added.

A very simple, but effective way to save electricity: **turn off lights (or other electrical equipment) when not used**. One has to keep in mind that it is **always** cheaper to turn lights off than to leave them on. Improving awareness of energy wasted can save up to 15% of energy costs.[10] However different kinds of lighting might require different solutions (e.g. High Pressure Sodium, like some of the laps used in warehouses, cannot be quickly turned off and back on again).

To the same effect one should make good use of natural lighting, as most people prefer to work in natural light. One can do this by ensuring that windows and roof lights are not obstructed, and are regularly cleaned, inside and out. Blinds should be used only if necessary, as they are often left closed leading to artificial lighting being used, regardless of daylight availability. It is unlikely that glare will affect the same part of a building all day.

If a company is just establishing itself or it plans to expand and set up new facilities, it could be beneficial to locate these facilities in the **vicinity of employees'** apartments. Companies could otherwise also pay employees' public transport tickets, bicycles, and encourage car-pooling (driving together with other employees). The shorter the way of the employee to his work, the better the environmental performance and the performance of the employee due to less travel time.

It is fundamental that simple savings practices are promoted among the staff.

3. Smart/strategic logistics

A third area of possible improvements, in addition to technology and personnel, is an area, which will be called smart or strategic logistics, i.e. the improved management of the supply-chain. In the main section further down you will find various examples of such smart logistics solutions. These have the great advantage over technology that the

[10] http://www.loseyourexcuse.gov/docs/lyefacts.pdf

costs are limited and they will often remain as an integral part of the business process over a long period of time, while technology often has to be replaced after some years to have the newest or best available technology. The training of personnel is also producing long term effects, but personnel may leave (with the training it has received) and starting from scratch become necessary, once new employees are hired.

There are various ways to improve the management of the supply-chain. Some of the following examples have been put into practice by companies with great success. You will find more information of those success stories later in the document.

Route planning enables a company to identify less profitable (or more costly) routes, whose planning can be optimized. In commercial Route Planning less profitable routes can be abandoned to the competition, if no other solution is available. Modern computer programmes, in addition with tracking and tracing technology and reporting schemes, are able to calculate the best solutions and the best routes. Identifying a non-profitable route is the first step to amending the situation. Here software can also help, but often a forwarder will need to look for solutions without the help of management software, once the problem is identified (e.g. find new customers to decrease empty running).

Intermodal solutions can bring great benefits, because they combine the best of various modes of transport, possibly to improve the overall performance. When carrying goods from A to B, it is generally advisable to look for alternative solutions and compare them. It is thus possible to create geographical shortcuts in the trips (e.g. in several places in the Mediterranean), decrease the dependency on fossil fuel, whilst reducing greenhouse gas emissions. Transhipping cargo units may be costly and this is the reasons why it is essential to cut on costs wherever possible, e.g. by using the European Modular System at the end legs of intermodal trips.

Smarter city distribution is a planning system that enables forwarders to optimize the use of urban infrastructure and allows them to put the specificities of city delivery requirements to value. CLECAT has identified a series of public measures at European level that would help accommodate freight transport in inner urban areas, e.g. dedicated bus/HGV lanes, 24 hour delivery times, enhanced public transport use for passengers, building of infrastructure for electric vehicles, hybrid technology in busses and delivery vans, multi purpose city distribution centres, etc. At local level some of these measures have already been tested and successfully put in practise. As a forwarder, one should explore these possibilities, approach local policy-makers and administrations and start collective negotiations in order to achieve better managed freight transport even in city centres.

The Consolidation of cargo is one of the best techniques to cut costs and emissions. It increases logistics service providers' revenues whilst offering lower costs to shippers and providing environmental advantages to all. Consolidation works both in transit (groupage services) and when goods are standing still (third party warehouses) Consolidation has only advantages: less freight traffic, less environmental damages, better utilization of vehicle fleet, less space occupancy, etc. The only problem is overcoming the "ownership" prejudice, which often makes ones' "own" warehouse, truck, van, aircraft look better than a shared one. There will be Best Practices examples further on in this document about consolidations and their advantages.

IV. Concluding remarks

CLECAT hopes to provide with this guide a tool for companies to improve their way of doing business, primarily from an environmental point of view, but also from an economic point of view. Best practices are an important tool to gain sometimes small, but sometimes also big improvements that in the long run can be visible in a company's balance at the end of the year.

While the term 'best practices' implies that some source has the final answer to a matter in dispute or disarray, one has to acknowledge that best practice, in the sense it is used in this document (i.e. any kind of improvement in technology, operation or workforce management, resulting in economic and/or environmental benefits for the relevant company), should never be seen as a final solution, but rather as one important step towards a constant improvement in the flow of business operations. In this light we believe that sustainability best practices should be inserted straight into the quality management of our companies and become an integral part of it.

The practitioner is best placed to evaluate a new measure and report on its success for the benefit of its company and, by means of this or similar instruments, the trading community, its customers and the environment at large. For this reason all are encouraged to submit their experiences and suggestions, especially the very rarely seen best practice examples in the area of air, rail and maritime transport would provide a welcome and important addition to this Best Practice Guide.

BEST PRACTICE EXAMPLES

The following part is the most important part of this document: the descriptions and references to the various best practices experienced and reported by companies and organisations. It is divided in 3 different sections: best practices relating to Technical, Organisational and Workforce aspects.

Each best practice case will contain a header, which describes why this is to be considered a best practice for a given company. This is followed by the aim which stood at the beginning of the company's decision to improve its performance. A short methodological presentation follows, whilst at the same time it precedes the costs analysis (if available) and the results. More information is normally available at the web links that appear at the very end of each section.

It has to be stressed that there is always more information available for each of the best practices listed hereunder. This CLECAT document just gives the highlights. All are welcome to contact CLECAT's Secretariat for specific questions. Your question will either be answered directly or you will be put in contact with the companies that successfully introduced the related measure into their business paradigm.

I. Technical

1. *Information Technology for Efficient Road Freight Operations (Department for Transport, UK with RHA and FTA)*

Aim: Help logistics and transport professionals to better understand a range of different IT systems that can be used within their operation, and offer practical advice to help them choose and implement a system.

Methods: Use Fleet Management Systems to gain extra benefits: Fleet management systems are essentially advanced database applications that can help you manage the day-to-day administration necessary to keep vehicles on the road (keeping track of when vehicles need to be inspected, when MOTs are due, etc), and help you manage information about your fleet over time which you can use to generate reports and KPIs on a wide range of operational areas (including fuel use, accidents, maintenance costs and service history). Fleet management systems are generally made up of a number of modules or database tables on different operational areas, such as vehicles, drivers and the workshop, and these are all tied together to allow you to generate information on your fleet activity as a whole.

In principle there are different factors, which can be managed to achieve efficiency gains ➔ managing deliveries (paperless manifest/POD systems), one freight exchanges, traffic information systems, simple journey planning tools, CVRS[11] systems, haulage pricing tools/job costing systems, managing vehicle systems (in-cab communication systems, vehicle tracking systems, satellite navigation systems, vehicle diagnostics systems), managing products (warehouse management systems, voice picking systems, product scanning and tracking systems – RFID, supply chain planning and management systems), managing loads (trailer tracking systems, telematics-based temperature

[11] Commercial Vehicle Safety Regulation (**CVSR**)

control monitoring systems, vehicle weighing systems, security systems), managing drivers (driver information systems, digital tachographs and hours compliance tools), and managing fuel (fuel recording systems).
Steps to take: identify the need ➔ select the system ➔ implement the system ➔ monitor and improve the system (there are further steps and cautionary principles mentioned in the document).
Costs: € 52.250 (for a case study)
Results: Financial benefit of € 123.000 each year.
Link / More Information: http://www.freightbestpractice.org.uk/information-technology-guide-for-efficient-road-freight-operations

2. *Telematics for Efficient Road Freight Operations (Freight Best Practice / Department for Transport, UK)*

Aim: Telematics can provide information about performance that may be difficult to collect by other means. This data can identify mechanical problems or poor driving styles that can have a significant adverse effect on operating costs: excessive or deteriorating fuel consumption; over-revving within a gear; harsh braking; gear changing at inefficient engine revs; accelerator pedal pushed to the floor when accelerating.
Method: Report identifies 6 key areas, where telematics can be useful: Vehicle and driver data; paperless manifest and proof-of-delivery systems; vehicle and trailer and asset tracking systems; satellite navigation systems; safety and security systems
Potential benefits of telematics ➔ reduced fuel consumption through effective fuel monitoring, to identify losses and improve future vehicle specification; reduced fuel consumption and maintenance costs through effective driver performance costs through effective driver performance monitoring, promoting improved driving styles; reduced accident rates which could lead to lower insurance costs; increased vehicle and load security; vehicle and driver information can be used to set up driver league tables.
Costs: for additional technical equipment and improvements
Results: Very wide applicability of telematics, which can be used to solve various problems. Example areas for improvement are high vehicle maintenance costs, high road accident rate, inaccurate time sheets, invoicing errors, or unpredictable traffic delays en route.
Link/More Information: http://www.freightbestpractice.org.uk/telematics-for-efficient-road-freight-operations

3. *Solar roof to save energy (FedEx, USA)*

Aim: substituting power generation with renewable sources using existing assets.
Method: FedEx Ground plans to install the nation's largest rooftop solar-electric system at its distribution hub in Woodbridge, N.J. The solar power project is the third between a FedEx operating company and BP Solar and the fifth solar power project for FedEx. The 2.42 megawatt solar power system will cover approximately 3.3 acres of rooftop space with approximately 12,400 solar panels. When completed, the system will be capable of producing approximately 2.6 million kilowatt-hours of electricity a year and could provide up to 30 percent of the hub's annual energy needs.
As part of the agreement, BP will install and operate the solar power system and FedEx will purchase the power generated. Installation is scheduled to begin in August 2009 and expected to be completed by November 2009.

Results: When the system is fully operating, the combined environmental benefits based on a projected annual reduction of approximately 1,867 metric tons of CO_2 emissions, are equivalent to one of the following:

- More than 340 passenger cars not driven for one year.
- 802,129 litres of gasoline not burned.
- 4,300 barrels of oil not consumed.
- 259 households' electricity use for one year.
- 47,872 tree seedlings grown for 10 years.
- 13 acres of forest preserved from deforestation.

Data is derived from the U.S. Environmental Protection Agency's greenhouse gas equivalencies calculator.
Link/More information: http://news.van.fedex.com/fedexgroundsolarpanel

4. Fuel Saving Devices (Department for Transport, UK)
Aim: It is important for managers to find the solution custom-made for the requirements of each company. The guide provides several examples and tips how to discern which methods and technologies will give you the most benefit.
Methods: Be aware of the 5 stages of the fuel process: delivery/storage/dispensing; vehicle tank to engine; through engine to flywheel; flywheel to road wheel; energy to vehicle motion ➔ fuel can be lost at every one of these stages.
Become familiar with the various product types: aftermarket fuel additives; combustion improvers (catalysts and magnets); lubricating oils and additives; claims for oil additives; Euro IV and Euro V Legislation (operators at the moments can meet these requirements using either the Selective catalytic reduction or Exhaust gas recirculation methods).
Key to a successful introduction is product testing. Avoid poorly organised trials, ignoring seasonality, poor quality data. If possible contact manufacturers who could possess the test results on various parameters, which one need to take into account.
Costs: Additional equipment / fleet upgrade
Results: Fuel savings, depending on which method is used
Link/More Information: http://www.freightbestpractice.org.uk/fuel-saving-devices

5. Fuel Management Guide
Aim: To save fuel this guide has gathered a large amount of measures with backup strategies and tips for monitoring the process along the way.
Methods: Provide information, advice, and suggestions to improve the fuel performance of your goods vehicle fleet. Provide information about a Fuel Management Programme and how to implement it. Provide a checklist of key points to consider.
Costs: varies
Results: Fuel savings through better management and technology. For details, see the guide.
Link/More Information: http://www.freightbestpractice.org.uk/fuel-management-guide (85 pages)

6. SmartWay, US Environment Protection Agency.
Aim: The SmartWay brand identifies products and services that reduce transportation-related emissions and optimises fuel consumption.
Method: engage in SmartWay programmes, which result in significant, measurable air quality and/or greenhouse gas improvements while maintaining or improving current levels of other emissions and/or pollutants.
Cost: depends on the programme.

Result: depends on the programme. Generally savings in fuel consumption and reduction of GHG emissions.
Links/More information: http://www.epa.gov/smartway/basic-information/index.htm

7. Reduction of Waste through an Oil Treatment Plant
Aim: to have waste water treatment as additional service for customers.
Costs: ca. € 1 million
Results: overall reduction in waste and more efficient processing. A positive return of investment after 5 years. High customer satisfaction.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/amals.pdf

8. Reduced Water Consumption by Using a Modern Washing Facility
Method: investment into a new washing facility, which allows the company to wash 9,000 trucks per year.
Costs: € 100,000.
Results: wash-water usage reduced by almost 50%. Reduced clean-water costs from € 1,835 down to € 917.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/berger.pdf

9. Introduction of Power Saving Technology
Aim: reduce electricity consumption.
Methods: several technical improvements, e.g. motion detectors and relays for refrigerator compressors. The electricity meter is read regularly to monitor electricity consumption.
Costs: € 2,500
Results: in the first 6 months after installation € 1,200 could be saved. The investment will be amortized in just over one year.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/sorensen.pdf

10. Double-deck Cargo for Increased Efficiency (Emons Cargo)
Aim: to reduce the number of transport movements by developing a double-deck truck.
Method: based on a technique used in the glass industry, trailer capacity was increased from 33 to 52 europallets. All trailers are equipped with their own handling equipment.
Costs: a double-deck trailer costs € 90,000.
Results: 52% additional capacity compared to a conventional 33-pallet trailer, equalling a 34% reduction of kilometres driven. 5% of all full-load shipments in Europe would be suitable for transport with the double-deck.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/emons.pdf

11. Use of Intermodal Transport (Ewals Cargo Care)
Aim: to enhance and draw advantages from intermodal transport.
Methods: Ewals has set up a hub-and-spoke network for long-distance haulage. At least two modes are used to transport the cargo from pick-up to delivery.
Costs: no extra costs, because intermodal transport over long distances is competitive with road transport.

Results: CO_2 could be reduced by at least 32% in comparison to road transport. The intermodal transport has reached and even bettered the goal of 92% utilization.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/ewals.pdf

12. Monitoring Fuel Consumption (Ewals Cargo Care)
Aim: Reducing fuel consumption
Method: development of special data sheets to monitor fuel consumption per truck. Processing of the data with the help of a computer programme.
Costs: none (sheets were developed during working hours)
Results: management can result quickly to unusually high fuel consumption. Employees are motivated to drive economically, because they will be compared to their colleagues.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/ewals.pdf

13. Reduction of Emissions by Use of Low-emission vehicles (H.P Therkelsen A/S)
Aim: lower emission with the purchase of up-to-date EURO level trucks (at that time EURO 3). Because they have a higher fuel consumption, the company launched an initiative to increase transport efficiency.
Methods: investment in new technology (navigation systems and modern communication technology).
Costs: € 350,000 in new communication technology.
Results: Significant reduction in NOX, HC and CO2 emissions. Improved information flow means better co-operation between scheduler and driver as well as the company and its major customers. Drivers are motivated by the opportunity to drive new, modern vehicles. Because of the new communication system, they are also less disturbed by phone calls and paperwork.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/Therkelsen.pdf

14. Improved Vehicle Utilization through Mobile Sludge Drainage (Joma Slamsugningsservice AB)
Aim: The company searched for suitable technologies to reduce environmental impact. The Moos KSA system, with a specially equipped tank vehicle, was introduced for suctioning sludge from cesspits. When the waste water is sucked up into the vehicle's tank, a polymer is added that causes the sludge to flake, making it easier for the water to pass through the tank's filters.
Method: The project owner decided to focus on the Mobile sludge drainage concept and proposed this idea to its main client, Gislaveds commune (the local authority). The authority approved the concept and the company opened negotiations with the equipment supplier, Simon Moos in Denmark.
Costs: Equipping a truck with the Moos KSA system involved extra costs of about SEK 517,000 (€ 54,600).
Results: Driving distances, and thus emissions, have been radically reduced because the tank does not need to be emptied so often. Also, among other positive results, operating costs are approximately one sixth of those of conventional equipment because of the reduction in driving distances.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/joma.pdf

15. Eco Guardian – Lower Emissions and Fuel Consumption by a Comparative Trial of Vehicle Technologies (J. W. Suckling Transport Limited)

Aim: The objective of the Eco Guardian project (stage 1) was to conduct a comparative trial between two initially identical vehicles, one of which was then equipped with particle filters and operated on ultra-low-sulphur diesel (ULSD). The trial covered fuel consumption, emissions of the four main air pollutants (HC, CO, NOx and particles) and the costs involved.

Method: The measure was verified twice, the first time immediately after implementation (first test), the second time after six months in use (second test).

Costs: The cost of the tests amounted to ca. € 35.500.

Results: Reduction in total costs through higher fuel efficiency. Fuel efficiency: The Eco Guardian vehicle recorded an improvement of nearly 2% in fuel consumption against the control vehicle. Emissions: The Eco Guardian vehicle recorded significant reductions in emissions of all four air pollutants.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/suckling.pdf

16. Water-saving Equipment and Use of Rainwater for Vehicle Cleaning (Metzger Spedition GmbH)

Aim: High-pressure cleaners produce large volumes of wastewater.

Method: A new water-saving high-pressure cleaner was put into operation in 1996. It has led to a significant reduction in water consumption and the associated costs. The installation of water cisterns enables high-priced drinking water to be substituted by rainwater (which is free of charge).

Costs: The price of the high-pressure cleaner unit was € 2.820.

Results: The costs of drinking water and sewage disposal were reduced by more than 50% for 1999 compared with 1995.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/metzger.pdf

17. Reduction of Water Consumption (Transportes Campillo SA)

Aim: The goal was to reduce water consumption at the company site in Valencia.

Method: The following measures were taken: daily monitoring of the water meter; monthly and yearly recording of water consumption; inspection of the plumbing system; purchase of a high-pressure truck washing system; installation of a drip watering system for the gardens outside the building; installation of toilets that use less water for flushing

Costs: The cost of the high-pressure washing system was about € 2.750. The drip watering system for the gardens cost € 3.365.

Results: the consumption of drinking water was reduced by nearly 50%, reducing company costs by € 800 per year.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/campillo.pdf

18. Hybrid shunting locomotive (Port of Rotterdam)

Aim: ALSTOM Transport, in cooperation with the Port of Rotterdam Authority and Rotterdam Rail Feeding, is starting up a practical trial with a hybrid shunting locomotive.

Methods: The new locomotive saves energy by reusing braking power. The difference between conventional and hybrid engineering is in the drive technology. The diesel engine in the hybrid locomotive is smaller, and in principle is not kept running during the

often long waiting times in the shunting process. The auxiliary and drive systems are then powered by a battery. With a hybrid locomotive the diesel engine runs at maximum capacity only when there is a demand for maximum power or in order to charge the battery.
Because of the relatively small diesel generator and the battery pack, savings can be made on fuel and maintenance costs, and so the investment in such a locomotive can be recouped in just a few years and the emissions of exhaust fumes, particulates and noise substantially reduced.
Costs: not known
(Estimated) Results: Alstom expects to achieve fuel savings of at least 40% and to halve the volume of CO2, NOx and particulate emissions. Noise will also certainly be reduced by 15 dBa and the company is counting on reducing maintenance costs.
Link/More information: directly from the Port of Rotterdam.

19. Transport of waste materials by water (London Waste and Bywaters/SmartBarge Ltd, UK)

Aim: Using a new barge concept of a container with recyclables.
Methods: Containers are transported half a mile by road to a material recycling facility for sorting. For the return sailing the barge was loaded with a container of residual waste and returned to an energy recovery facility. Unlike conventional steel barges, SmartBarge is made up of modular components incorporating a steel chassis and rotor-moulded polyethylene float sections. The modules lock together and act like a life ring around the hold or the container, being carried.
Costs: £ 7 million
(Estimated) Results: the SmartBarge has a tremendous flexibility as it can be filled with different types of containers and different loads. Reducing GHG emissions (water transport has 20% of the carbon footprint of road).
Link/More information:
http://www.letsrecycle.com/do/ecco.py/view_item?listid=37&listcatid=217&listitemid=51775&section=waste_management (with further links to the companies involved)

20. Improvement in aerodynamics (Aspray Transport Ltd / Freight Best Practice)

Aim: Improve fuel efficiency by retrofitting with aftermarket options.
Methods: Review the options and use the relevant Freight Best Practice guide (see below) to get an overview of the different options. Cost/benefit analysis with the help of special software.
Costs: for new technology/equipment
Results: Fuel savings, depending on the measures that have been applied
Link/More information: Freight Best Practice's "The Quick Guide to Truck Aerodynamics" (http://www.freightbestpractice.org.uk/quick-guide-to-truck-aerodynamics) and "Aerodynamics for Efficient Road. Freight Operations" (http://www.freightbestpractice.org.uk/aerodynamics-for-efficienct-road-freight-operations)

21. The Benefits of Operating Electric Vehicles in an Urban Environment (TNT / Freight Best Practice)

Aim: use the advantages of electric vehicles in urban transport.
Methods: exchanging diesel vehicles with electric vehicles makes it necessary to change some operational practices.
Costs: investment in a new vehicle fleet. Specific costs unknown.

Results: Fuel cost approximately 20% of diesel equivalent: potential for reduced maintenance through fewer mechanical parts.
Link/More information:
http://www.freightbestpractice.org.uk/default.aspx?appid=2000&fileid=929

22. Innovation Secures Future at Rural Haulier (Andrew Black Limited)
Aim: identify and invest in new technology for vehicles to improve performance.
Methods: the following technologies have been investigated (details in the study): Fleet tracking and telematics; onboard weight; weight saving equipment; lift axles and tyres saving; braking optimizer. In addition business processes can be improved, in this case: clean vehicles (save time and effort for maintenance); wheel alignment; diagnostic equipment; disc brake re-grinding.
Costs: depending on your vehicle fleet. For 30 vehicles all measures taken together cost: ca. £ 350,000.
Results: Minimising vehicle downtime and maintenance; reducing tyre wear and improving fuel consumption. Annual savings in CO_2 and costs have been amortised after 3-7 years.
Link/More information:
http://www.freightbestpractice.org.uk/default.aspx?appid=2000&fileid=943

II. Organisational

1. The European Environmental Agency's Good practice in Logistics Manual

Aim: General, comprehensive document, which lists good environmental practices in the logistics sector. While the main focus lies in the Mediterranean area, the basic concepts can be applicable everywhere.

Method: Divided into 4 chapters. Most important are chapters 2, 3 and 4.

- Chapter 2 describes how to plan and carry out the introduction of a programme of good environmental practises (PGEP) in accordance with the dimensions and specific nature of a business, ranging from the independent transporter to a complex logistics operator.
- Chapter 3 describes the environmental impacts created by the sector's activities and good environmental practises (GEPs) that can be introduced to reduce them.
- Chapter 4 contains a driver's manual, which gathers together good environmental practises for raising quality and decreasing environmental impact and a guide for an initial evaluation of the environmental situation of a business in this sector.

Costs: depending on the best practice.

Results: depending on the best practice.

More information: http://www.cprac.org/pdf/estudis/sectorials/logistica_eng.pdf

2. Fuel Management for transport operators (Thorntons plc)

Aim: Fuel improvements can be improved by adopting simple measures involving the monitoring and publishing of fuel performance results. Eliminating errors from manually collected data is essential, if good results are to be obtained.

Methods: drivers/management adopting a disciplined approach to fuel management; regularly calibrating the on-site pump; correctly recording the fuel obtained in transit; ensuring that vehicle tanks are completely full each time odometer readings are taken; checking the record for mistakes; accurately monitor fuel performance of a group of similar vehicles selected from the fleet; inform the drivers how their vehicles were performing; train and encourage the drivers to improve the fuel performance of their vehicles; measure and report the improvements.

Costs: for training of drivers, new technology/equipment

Results: immediate fuel savings results. Additional savings can be made by the use of suitable on-board data-loggers (apparently they will pay off between 6-18 months after purchase) ➔ savings account between 4.4 – 8.4% of the operational cost.

Link/More Information: http://www.freightbestpractice.org.uk/fuel-management-for-transport-operators

3. Fuel saving tips, Department for Transport, UK

Aim: The brochure, mentioned below, is a short, comprehensive guide with several tips for fuel saving. It gives an overview over short and simple fuel saving tips, particularly aimed at small-fleet operators and owner-drivers. Because of its size, it can be taken onboard a vehicle for the driver's consideration.

Methods: Fill in your truck operating costs; identify resistance of your truck (tyres, trailer front fairing, air dam, etc.)

Costs: none

Results: Fuel savings equal economic benefits

Link/More Information: http://www.freightbestpractice.org.uk/fuel-saving-tips

4. Performance Management for Efficient Road Freight Operations

Aim: The guide gives decision-makers an understanding of performance management concepts in freight operations, as well as advice on putting a performance management process in place.

Methods: Various case studies on improving the management of freight operators.

Provides a guide to be used as a reference document, providing guidance on concepts relating to performance management in freight operations and introducing the types of key performance indicators that can be measured in an operation.

Main themes covered by the guide: Key Performance Indicators (KPIs); roles of management; measuring process; measuring tools; analysis of results; benchmarking; strategies to increase performance.

Costs: depending on the measures: none or costs for new equipment

Results: depending on the measures

Link/More Information: http://www.freightbestpractice.org.uk/performance-management-for-efficient-road-freight-operations

5. BESTUFS – Best Urban Freight Transport

Aim: Aimed not only at practitioners, but also at regulators. Main focus is urban freight logistics. Not only efficiency, but also sustainability is addressed. It is divided in three parts: goods vehicle access and loading approaches in urban areas; principal issues involved in the last mile solutions; principal issues associated with urban consolidation centres.

Methods: Many measures, including: signings, lorry routes, urban freight information and maps, on-street loading bays, nearby delivery area (ELP), urban consolidation centres, vehicle weight and size regulations, time regulations, imposing and enforcing access and loading regulations, environmental zones/emission standard regulations, night delivery, lorry lanes, road charging systems.

Other areas of interest are the efficient usage of infrastructure, technology in urban freight, environmentally-friendly articles and the possibility of joint working between public and private sectors.

Costs: depending on the measure

Results: depending on the measure

Link/More Information: http://www.bestufs.net/gp_guide.html

6. Consolidation of Transports (Sieber)

Aim: Wishing to concentrate on its core competencies, Sieber's customer, a medium-sized electronics manufacturer, did not want to invest in new warehouse facilities, but rather to invest in its production capacity. The customer wanted elements of its procurement processes to be executed by an external service provider in order to reduce the complexity of its own procurement activities.

Methods: Sieber was able to offer dedicated warehousing capacity to the customer, which could be adapted flexibly to the volume and dimensions of the goods the customer needed to stock. Sieber also took over the organisation of deliveries, consolidating and delivering product components in the right sequence to the customer. This solution reduced the number of deliveries through the mountains by factor of 100.

Challenges to overcome: Organisation of transport to the new warehouse and the management of the associated processes; handover of procurement – information provided by the customer to Sieber; allocation and process design of warehousing capacity at Sieber;

Costs: additional costs through warehouse management, but also additional revenues.
Results: Economic and environmental benefits through consolidation and reduction of freight traffic between the logistics provider and manufacturer
Link/More Information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/2008_sieber_consolidation.pdf&t=1253291634&hash=e924c82315b146c174b81a52c3ac9b41 (it is necessary to have a login for the website)

7. Transport Collaboration – Carpathia Express (Czech Republic)
Aim: The productivity of rail transport has been steadily declining in recent years. This fact, together with a desire to develop a new innovative product for existing, as well as potential customers, has lead a team of logistics professionals to design a brand new commercial logistics project. It builds on the close cooperation of these three traditionally competing freight forwarders and three national rail transport providers with the ultimate aim of maximizing the resource utilization of all parties involved and at the same time increasing the productivity and competitiveness of rail transport.
Methods: Pooling the individual customers of the project partners into services subsequently provided by the Carpathia Group; forming a common sales strategy; increasing productivity and countering negative trends in the transport industry, despite the overall decline of rail freight volumes (on a given route); radical reduction of contemporary standard transport journey times; cut overall costs in a way that enables operators to cut the prices charged to their customers substantially; increase in competitiveness; ensuring transport and pricing flexibility while adhering to fair-play principles.
Costs: not available
Results: Average 66% saving on journey times compared to other transport modes; high quality 'one-stop-shop'- type of service for project customers including checking, space reservation, dispatch operations, etc.; the product developed product is widely available and beneficial not only for local customers, but also for customers located in western and northern Europe; the original customer portfolio during initial 6 months of commercial operations was extended by 400%.
Link / More Information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/20090421_Carpathia-Express.pdf&t=1253291659&hash=6e3fafb945e706dab4af3a9171929563 (it is necessary to have a login for the website)

8. Telematics at SME's (Sieber)
Aim: Rising fuel expenses are the driver for investments in fuel-saving technologies - even for an SME.
Methods: The company engages the collaboration of the drivers in the improvement process. It uses telematics solutions in order to reduce the fuel consumption of its truck fleet by monitoring the driving style of its staff.
Costs: For new equipment (telematics systems)
Results: Telematics monitors the driver's driving behaviour. Conversation between workshop personnel and the drivers helps improve driving styles. Sieber drivers have saved at least two litres per 100 km.
The savings achieved, from reduced fuel consumption and reduced component wear, e.g. on brakes, are 1.5 to 2 times the cost of system implementation and maintenance.

Link / More Information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/2008_sieber_telematics.pdf&t=1253291634&hash=baee8055e0214e3e3ab3a795838bebd3 (it is necessary to have a login for the website)

9. Improvement in Utilization through Customer Incentives (Aamaals Miljöhantering)
Aim: to prevent empty trips, improve company profits and reduce emissions by improving vehicle utilization.
Methods: The company found cargo to be transported back to their facility. An incentive programme was put in place and the company was able to offer better prices to their customers.
Costs: none
Results: benefits for the environment, vehicle utilization today averages 90%
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/amals.pdf

10. Measuring, Monitoring and Reducing Fuel Consumption (Egon Sörensen Transport A/S)
Aim: reduce fuel consumption.
Method: drivers have to record their mileage and fuel consumption after each trip. Also recorded are the amount of goods and the route. Software can analyze the data and show savings and possibilities to decrease the environmental impact of transportation.
Results: Fuel consumption could be reduced by nearly 6,800 litres, equalling a cost reduction of ca. € 4.500.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/sorensen.pdf

11. Tankshare – Improved Utilization through Groupage Freight Service (J. W. Suckling Transport Limited)
Aim: minimized empty running through shared utilization of transport capacity by its customers.
Method: In April 2000, a pilot scheme was launched and attracted significant interest amongst oil companies. Fourteen companies used the service during its pilot stage, paying rates based on a simple price-per-litre basis, by postcode, depending on delivery load size.
Costs: TankShare is a commercial initiative and, apart from the purchase of new vehicles, required no specific funding to launch.
Results: Improved vehicle utilization and consequent reduction in empty running.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/suckling.pdf

12. Improved Material Planning through Communication (K. I. Transport)
Aim: a communication group was founded that consists of members from the transport company and its most important transport buyer. The goal of this group is to improve communication, thereby ensuring a faster exchange of data and knowledge about specific transport tasks, and understanding of the importance of the data needed by transport companies.
Method: the flow of information and goods was analysed from receipt of an order to delivery of the goods to the customer. In this co-operative approach by shippers and the transport company, the individual processes were clearly distinguished and possible

areas of improvement were identified, particularly in the working conditions for staff in the material-planning department.
Costs: no extra costs
Results: By increasing the overall planning time for individual transport tasks from two to six hours, capacity utilization of the vehicles was increased by 5-10%. Overall, employees spend less time planning, loading and executing transport tasks (for example, adhering to rest times and other regulations). The amount of damaged goods was reduced by 10% per year. Fuel costs were reduced. Fewer mistakes were made, communication was improved and IT was integrated more smoothly. Communication is now more direct and effective (members of the communication group know who they can contact in the other company). Mistakes are uncovered and resolved more quickly. Customer loyalty is increased.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/kl.pdf

13. Security and Resource Efficiency through an Integrated Management System (Nijman/Zeetank Holding BV)

Aim: The company wanted to ease the transport of Dangerous Goods, especially those transported through various countries, by creating a software that can ensure compliance with all the safety and environmental requirements.
Method: Create an Integrated Management System (IMS) in accordance with ISO 9901/OHSAS (Occupational Health and Safety Assessment Systems) 18001 to comply with safety and environmental standards. Also the SQAS (Safety Quality Assessment System), the IMDG (International Maritime Dangerous Goods) code and the DGSA (Dangerous Goods Safety Adviser) directive were involved in building up the system. The key step for implementing the IMS was selection and purchase of suitable quality management software. This software includes a quality monitoring tool, a safety management tool and also an environmental tool.
Costs: unknown.
Results: time savings and quality assurance. Through better understanding of the supply-chain they were also able to optimise multimodal transport, which in effect reduces the CO_2 output.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/nijman.pdf

14. Loss Prevention for the Vehicle Fleet (Nobilia International)

Aim: Because of possible injuries and traffic jams, traffic accidents represent a problem for transport policies. However, they also have a direct economic effect on the transport operator. For this reason, Nobilia International implemented a loss prevention system for its vehicle fleet.
Method: the following processes, procedures and risks were analysed in depth: office management; driver recruitment, deployment and organization; material planning processes; route planning; loading risks; vehicle safety equipment; number and type of accidents; time and location of accidents. When all the data had been analysed, a customized loss prevention concept was developed that highlighted three areas in particular: driver training, driver recruitment and accident analysis.
Costs: not yet known
Results: a 57% reduction in the number of accidents; less serious consequences of accidents (injuries, traffic jams); better fuel efficiency because of less damage to the trucks; a reduction in emissions through the use of EURO 3 trucks. By reducing the

number of accidents from 88 to 38, the total cost of accidents was reduced from € 306.000 to € 132.100.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/nobilia.pdf

15. *Reduction of Environmental Impacts by Management (Otto Görgens Spedition-Transportlogistik / Lübeck)*

Aim: In collaboration with BGL, DaimlerChrysler and DEKRA Automobile Ltd, the company created a strategic concept for emission reduction while carrying out inventory control of its vehicles, volume of cargo, frequency of repair work, fuel consumption and the resulting environmental impacts.
Method: Each driver himself keeps logs and creates graphs and diagrams with regard to load status, road/traffic conditions and fuel consumption. Real fuel consumption can be calculated using the diagrams from the driver logs and record sheets from the tachometer, which show distance driven and speed. The programme is further supplemented by the monitoring of repair costs, analysis of weak points and continued education for all drivers. To calculate future fuel consumption, the company determines the number of vehicles required based on expected cargo volumes, and this is made into a target specification.
Costs: A total of € 920.000 was invested in new vehicles. The cost for the contract worker was € 12.780.
Results: The following results have been achieved: savings in fuel: 19.3%; savings in oil: 5.0%; CO2 emissions reduced by 38.7%; NOx emissions reduced by 28.6%; all vehicles run more quietly due to state-of-the-art technology.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/gorgens.pdf

16. *Regulations for Good Common Practices in the Road Transport of Dangerous Goods (Trancister Sociedade de Transportes SA)*

Aim: The main goals are the reduction of accidents, crossovers, spillages and incidents that cause new accidents. The motto of the project is "No accidents in three years' time".
Method: The project involves a large number of procedures that can be summarized in the categories driver regulations and vehicle regulations (audits, safety management systems, set of procedures with the aim of increasing safety throughout the company's activities, Project "Operational System of Supporting Accidents", ISO 9002 certification).
Costs: The cost of implementation is estimated as 2-3% of annual turnover.
Results: Elimination of spillages (oil pollution), reductions in fuel consumption through training and defensive driving, reduced accidents through increased training, increased general safety, improved corporate image.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/Trancister.pdf

17. *Improved Efficiency through New Information and Communication Technology (NICT) (Transportes Luís Simões)*

Aim: improve communication between all operational centres, customers and drivers.
Method: installation and implementation of the NICT. The first consists of an analysis of the company's current communications infrastructure. The second is the "Strategic Plan for Communications". This plan outlines recommendations for the reorganization and optimization of existing systems in terms of functionality and research costs. The main aspects covered are the local and extended network infrastructure, mobile

communications with the vehicles, Intranet and Internet architecture, communications with customers and system security.
Costs: Investments over the past year in new information and communication technology have amounted to about € 550.000
Results: Reducing the number of empty trips by ca. 2%; easier control of the company's objectives; better communication between clients, drivers and centres; simplified administrative processes; substantial reduction in communication costs.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/simoes.pdf

18. Implementation of an Environmental Management System (EMS) (Transportes Ochoa SA)

Aim: reduce their consumption of raw materials, water and energy while at the same time benefiting from various advantages such as decreased costs, higher competitiveness and an improved public image
Method: the company started the implementation process for an EMS in 1999 by participating in the SIGMA I and SIGMA II projects. The system is in accordance with the ISO 14001 standard. Necessary steps: selection of a consultancy company preparation of an "Initial Environmental Revision" by the Bureau Veritas Español based on data collected at the company's sites in Madrid and Zaragoza; development of a work plan and time schedule for EMS implementation; development of documentation (management manual, operational processes manual).
Costs: The breakdown of implementation costs to date is as follows: Consultancy fees and EMS development costs € 11.840; Legal consultancy fees € 2.400; Personnel costs € 22.550; Estimated certification costs: initial audit € 2.200; Periodic audits € 750 each.
Results: The average fuel consumption in 1998 was 29.52 litres/100 km, reduced to 28.17 litres/100 km in 2000, representing a decrease of 4.56% in just two years
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/ochoa.pdf

19. BT Transport Exchange Group – Improving efficiencies within a scheduled trunking service

Aim: maximise load utilisation on certain lanes and meet Corporate Social Responsibility (CSR) obligations to minimise carbon footprint within their transport division.
Method: Haulage Exchange is the UK's pre-eminent freight exchange for the road transport industry. In summer 2008 the company developed a new section of the exchange: "Regular Runs". "Regular Runs" enables professional operators to advertise scheduled vehicle movements to a wide audience of transport professionals, and thereby gain a number of benefits.
Costs: not known
Results: improved vehicle utilization, enhanced communication with new trading partners, streamlined communication, and reduced carbon footprint.
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/20090414_BritishTelecom_01.pdf&t=1253291461&hash=d56ef7a84000a835e2a43ac9dc1fe241 (it is necessary to have a login for the website)

20. Cargo Domizil – Intermodal less than truckload transport

Aim: Cargo Domizil created as a division of SBB (The Swiss Rail) to execute unit load rail shipments. Nowadays it is in the hand of consortium, which uses the company's rail

capacity to solve the problems of the Swiss night trucking ban and the high tolls for trucks on Swiss roads.
Method: Cargo Domizil offers less-than-full-truckload (LTL) shipments via combined rail/road facilities. Cargo Domizil trucks collect consignments during the afternoon and take them to these rail-side depots. From there they are loaded on trains, forwarded to Olten near Zurich and sorted by the SBB and sent to their destination depot overnight. Structural changes were accompanied by a training programme.
Costs: Not known.
Results: Besides overcoming the night-time trucking ban and avoiding expensive road tolls, the use of rail offers significant advantages in Switzerland's mountainous regions, which are sometimes difficult to reach for large trucks.
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/bestLog_best_practice_CargoDomizil_intermodal_truck_transport.pdf&t=1253291374&hash=071354b0051ad0595b699f71a2f00161 (it is necessary to have a login for the website)

21. INDITEX – Pro-Kyoto Project
Aim: To tackle and decrease their CO2 emissions.
Method: Development of a Strategic Environmental Plan (2007-2010). One of the initiatives, which have been established and will be implemented by 2010, deals with logistics aspects:

- A Bio-Diesel programme for their entire vehicle fleet. For this purpose a supply network will be set up at loading points and along trucking routes.
- Fleet driver training courses on fuel-efficient driving, with all vehicles complying with the EU's EURO 5 standard.
- Zero-emission vehicles to be used in factories and logistic centres.
- In addition INDITEX plans to measure their Carbon Footprint and adopt strategies to reduce it.

Costs: not available
Results: Perceptions of the company will be enhanced by the company's environmental good practice. Reduced energy consumption produces increased economic efficiency. The use of biofuels accounts for 80% of the CO_2 reductions, which add up to 850 tonnes per year.
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/20090406_inditex_01.pdf&t=1253291808&hash=21c98808abe9a7e7448ffcd977044adb (it is necessary to have a login for the website)

22. MAPEI - Optimising goods collection cycle time
Aim: Inbound (raw materials) and outbound flows (finished products) are carried by truck, representing 250 trucks/day (average). Due to the increased production volume and the number of trucks arriving at and leaving the plant, traffic congestion increased around the plant, leading to negative environmental and safety impacts. The logistics system was therefore re-organised in order to optimise the cycle time for load picks-ups from the factory.
Method: The plant was reorganised from a logistics point of view, with the creation of new entry points, preventing queues of trucks. A new storage tank was built with high-speed loading pumps for bulk liquids, to cycle time. Logistics processes were modified, with overnight preparation of shipments of pre-packed products.

Costs: not available
Results: Reduction of average loading time, now standing at 78 minutes, in comparison to 130 minutes in a similar MAPEI plant that was not re-organised (- 40%).
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/20090414_mapei.pdf&t=1253291840&hash=ec6441cbc6135427ee192ed5b8c3c358 (it is necessary to have a login for the website)

23. Mercadona and Renfe: Intermodal Collaboration Distribution
Aim: The company is sustainability-oriented and wanted their suppliers to join in pursuing the company's objectives to obtain a win-win result. Taking into account environmental concerns, the company developed and launched an environmental plan involving its main logistics and transport supplier, called Acotral.
Method: Mercadona, with Acotral and Renfe, developed a plan to promote sustainable transportation in Spain, and signed a contract with Acotral and Renfe for them to transport non-fresh food and non-food goods. The contract specified that Renfe had to provide eight trains a week from Sevilla to Tarragona and from Sevilla and Valencia in a round trip. This new route connects suppliers' warehouses in the south of Spain with Mercadona Distribution Centres in the east coast.
Costs: not available
Results: This solution enabled Mercadona to reduce CO2 emissions by over 12.000 tonnes due to the number of its truck deliveries being reduced by up to 9.152 truck delivery journeys. Fuel consumption has been cut with less truck use, and there has been a 70% energy consumption saving.
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/bestLog_best_practice_Mercadona_Renfe_Transport.pdf&t=1253291869&hash=f9150aebc6f326e688e65e9b08f451c0 (it is necessary to have a login for the website)

24. Sharp's collaboration with the green transport marketplace, SmartWay
Aim: The company's goal was to get involved in the area of transportation and optimise the environmental performance of their supply-chain.
Method: Sharp decided to join a transport partnership - called SmartWay (see links at the end of this paper and also Best Practice I.6. further up) - which was implemented by the US governmental organisation EPA. A partnership between shippers and carriers, who committed to operating green transport practices, also led to increased revenue and cost savings. SmartWay Transport is a voluntary partnership between various freight industry sectors and the US Environmental Protection Agency that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions.
Costs: not available
Results: Reduced CO2 emissions by 1,383 tons, NOx by 26,5 tons, particulate matter by 1,1 tons and increased the percentage of rail shipments from 7% to 12% of the annual tonnage. Implemented a "No-Idling" policy at Logistics Centres. Increased the percentage of Sharp's SmartWay carrier usage from 33% tons in the first year to 97% by the fourth year.
Links/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/20090414_sharp.pdf&t=1253291899&hash=7f951ac0c0d340bc139e7686b0ca78f9 (it is necessary to have a login for the website)

25. Cargo shuttle between Port of Barcelona and SEAT

Aim: to reduce lorry movements and introduce an environmentally friendly method of transporting cargo from the port of Barcelona to the construction plant of SEAT in Martorell.

Methods: Cargometro is a joint venture of three regional operators: FGC, RENFE Operadora and Comsa Rail Transport. It uses the 17.5 km dual-gauge freight route between Route Can Tunis and Castellbisbal, built under the Madrid – Barcelona high speed programme. The transport of the manufactured cars is being done by the company Autometro.

Costs: the regional government has invested € 8.6 million. The contract with SEAT has a duration of 10 years.

Results: it is expected to remove 32 000 lorry movements from the roads per year.

Link/More information: directly from the company. Overview (in Spanish) can be found under http://www.ccoo.cat/mobilitat/documentacio/infomobilitat/20090601/seat.pdf

26. Freight Best Practice "Fuel Efficiency Intervention Trials - How to Test and Save"

Aim: Provide a tool for improving fuel efficiency of heavy goods vehicle fleets. From the publication: "*A fuel efficiency intervention is defined as a device, system or action introduced by a vehicle operator to reduce fuel use.*"

Methods: The brochure (see link below) provides a 12-step process which enables companies to develop a transition to new technology. The brochure also includes 12 case studies of companies that used the freight best practice tools with success.

Costs: depending on the measures that are being implemented. Costs will need to cover new equipment/technology.

Results: depending on the measures improvement of fuel efficiency.

Link/More information:
http://www.freightbestpractice.org.uk/download.aspx?pid=4876&action=save

27. "Tesco Sets the Pace on Low Carbon and Efficiency" (TESCO / Freight Best Practice)

Aim: To improve efficiency and reduce carbon emissions from its distribution operation.

Methods: More efficient fleet management by reviewing and assessing all its activities and the interfaces between the main operational areas, including: primary distribution; planning and loading; methods of transportation; network efficiency; delivery to stores. As a result they updated their warehouse management system and standardised all settings within the transport planning tools. They also looked for alternatives to road, i.e. multimodal transport. In addition TESCO increasingly used double-deck trailers for their road operations.

Costs: unknown.

Results: switching to multimodal transport has resulted in a drop of CO_2 emissions by over 2,750 tonnes per year. In one year they increased the use of double-deck units by 7% from 191 to 205 trips per day, taking 1,221,492 km off the road and saving 948 tonnes per year of CO_2. All measures together saved 7,489 tonnes of CO_2 per year.

Link/More information:
http://www.freightbestpractice.org.uk/default.aspx?appid=2000&fileid=889

28. Short Haul Rail Freight (Lafarge Cement Ltd / The Malcolm Group / Freightliner Ltd / Freight Best Practice)

Aim: prove the profitability of short haul rail freight in comparison to road haulage. The main challenges faced by rail freight are the tendency for longer end to end journey

times and the need to double handle products where an onward road journey is required
Methods: multi-modal service, providing the end-to-end delivery of products using road to rail and then back to road for final delivery. This provides a seamless customer collection and delivery service for products that can be containerised. From the customer's point of view this can be cost effective for just a single container using the service.
Costs: not applicable.
Results: significant savings in fuel and reduction of CO_2 output (e.g. for Malcolm annual fuel use was reduced from 352,538 litres to 158,326 litres, and CO_2 output was reduced from 927 tonnes per year to 416 tonnes).
Link/More information:
http://www.freightbestpractice.org.uk/default.aspx?appid=2000&fileid=942

29. Transportation of healthcare products by inland navigation (Baxter)
Aim: improve speed and reliability, lower transport costs and emissions, and improve overall efficiency of the Baxter distribution centre's supply chain in the Benelux region.
Method: Baxter shifted all of its incoming containers from the deep-sea ports of Antwerp-Rotterdam and Zeebrugge away from trucks and onto inland navigation barges. With this container traffic now entirely on the inland waterways, Baxter has decreased its transport costs by 23 percent, while maintaining efficiency through increased reliability – a clear preference for consistently on-time deliveries over speed – virtually no congestion costs, and huge reductions in CO_2 emissions.
Costs: unknown
Results: costs are down 40% down compared to previous solutions. Barges also only consume 20% of the fuel needed for road transport.
Link/More information: Baxter won the CLECAT/FIATA/ITF joint prize for Joint Prize for Innovation in Transport and Logistics along the Global Supply Chain in 2009. More information can be found here:
http://www.clecat.org/index.php?option=com_content&task=view&id=279&Itemid=19

30. Shell Chemicals Europe and Bertschi AG network redesign
Aim: Shell was facing the problem of lacking sufficient storage capacity for the chemical substances produced at its site in Wilton (Northeast England). They wanted to reduce the complexity in their production and storage process and also reduce the lead times to the final customer.
Methods: Bertschi as their Logistics Service Provider proposed a concept for the direct loading of the finished goods from the production tanks into tank containers 24/7. Bertschi invested in the training of their drivers, so that they could self-load their vehicles. The process of increasing the transport efficiency required Shell to standardise the size of its produced batches to 50+-ton. This enabled Bertschi to improve its transport efficiency by loading two 25-ton tanks rather than splitting the orders in 23-ton loads. Furthermore, Bertschi contributed to the increase in transport efficiency by improving back loads within their tanker fleet. All together both companies strived for much greater cooperation on the internal and external level.
Costs: significant costs for redesigning the supply-chain, in this case connected with investment in a new site.
Results: intensified use of intermodal traffic led to a decrease in CO_2 emissions
Link/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestl

ogorg/bestLog_best_practice_Bertschi_Shell_network_redesign.pdf&t=1253361445&hash=31c4728772f7ae43aab62a42da2a2919 (it is necessary to have a login for the website)

31. Reconfiguration of the supply chain structure (IKEA)
Aim: to optimize the supply chain structure in Poland.
Methods: IKEA evaluated logistics potential of all Polish suppliers. The most important issue was geographical concentration (50-100 km) of producers. A leader of the project was chosen and cooperation between the leader and the smaller suppliers was established. By consolidating the whole stock of products into one warehouse the overall efficiency was improved.
Costs: unknown.
Results: not only reduction in transport costs, but also environmental gains ➔ development of European "green" corridors; positive impact on resources utilisation; decreased fuel consumption; more effective land and facilities use; reduction of CO_2 and noise emission
Link/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/bestLog_best_practice_Ikea_Com40_reconfiguration_Supply_Chain_01.pdf&t=1253361493&hash=efcea0e401faa78915b2aeb564152b2a (it is necessary to have a login for the website)

32. Lovosice Inter-Modal Terminal (CD / Duss Terminal)
Aim: A terminal designed for loading and unloading of trucks onto railroad wagons became obsolete after the EU accession of the Czech Republic. The company looked for a new use. Since then also rail transport suffered a decline, while road transport was increasing. The aim was to turn around this development and increase the share of rail and intermodal transport.
Methods: The companies involved was of the opinion that demand for inter-modal transport can only be boosted by constructing a new or major reconstruction of an existing inter-modal facility, which would enable fast, safe, and affordable handling with individual cargo units. Dudd mbh maintains and develops the inter-modal terminal in Lovosice, and helps to attract traditional customers of road transport to inter-modal by superior service, customized solutions, and reasonable pricing justified by large enough volumes of its operations.
Costs: unknown
Results: decreased noise pollution caused by trucks on the roads; contribution to de-coupling of overall increase of transport volumes and traffic congestions on the roads; optional third mode available nearby by rail access to the Elbe river port
Link/More information:
http://www.bestlog.org/index.php?eID=tx_nawsecuredl&u=1210&file=uploads/tx_bestlogorg/bestLog_best_practice_Lovosice_Intermodal_Infrastructure.pdf&t=1253361533&hash=a4d69dd64c625674faf9430e882b17a6 (it is necessary to have a login for the website)

III. Workforce

1. *Impact of EcoDriving on emissions and fuel consumption*

Aim: Examine the connection between fuel consumption and eco-driving.
Methods: Apply eco-driving measures: the study examines whether eco-driving has any negative impacts, the study has been used to make measurements of driving styles, fuel consumption and emissions before/after.
Costs: not known
Results: In the study, fuel consumption was reduced by an average of 10.9%, which should be regarded as typical for training in EcoDriving. There is a clear-cut relationship between the percentage of time at more than half-throttle and higher emissions of hydrocarbons and carbon monoxide. It was not, however, possible to demonstrate any relationship between the percentage of time at more than half-throttle and fuel consumption and the emission of nitrogen oxides.
Link/More Information:
http://publikationswebbutik.vv.se/upload/2000/1999_165E_impact_of_ecodriving_on_emissions_and_fuel_consumption.pdf

2. *The Fuel Efficient Truck Driver's Handbook*

Aim: As a driver, you have a significant impact on fuel consumption. Alert, positive and professional drivers can reduce fuel use and hence vehicle emissions, operating costs and contribute to greater road safety.
Method: publication of a handbook, that collects various measures targeted at improving fuel efficiency by addressing the driver of the transport vehicle.
Costs: negligible
Results: fuel savings
Link/More Information: http://www.freightbestpractice.org.uk/fuel-efficient-drivers-handbook

3. *Engine Idling (case studies by Lloyd Fraser Group plc, Allies Bakeries Ltd, Ralph Coleman International Ltd, Leggett's Transport Ltd)*

Aim: Excessive idling of HGV engines is simply a waste of fuel and money. With modern vehicles, the cost of switching off the engine and starting up again is usually less than the cost of leaving the engine idling.
Methods: 4 stages: Plan your campaign ➔ brief your drivers ➔ run the campaign ➔ communicate the results
Duration: advisable to have a trial period: 2 weeks without anti-idling, 2 weeks with anti-idling measures
Costs: training and communication
Results: if results of the trial would be extended to a whole year, the company (Lloyd Fraser) would save 65.000 litres of diesel, € 65.250 and 170 tonnes of CO_2. The other companies have also experienced significant savings.
Link/More Information: http://www.freightbestpractice.org.uk/engine-idling-costs-you-money-and-gets-you-nowhere

4. *Reduced Fuel Consumption and Accidents through Driver Training (Berger Beteiligungsgesellschaft mbH)*

Aim: reduction of fuel consumption.
Method: driver education, each truck is equipped with a driver handbook that includes information on economical driving methods. To evaluate the programme a measurement system was created.
Costs: € 72.000 for training courses and evaluation
Results: fuel consumption was reduced, saving 1.12%, saving € 73.000 in 6 months. More dramatic was the reduction of accidents, with a reduction of 25%, which amounted to savings of € 88.000 in 6 months.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/berger.pdf

5. *Bonus System to Encourage Drivers to Drive Safely and Fuel-efficiently (H.P. Therkelsen)*

Aim: improve driver safety and fuel-efficiency.
Method: driver training and a bonus system for drivers.
Costs: Monitoring of costs for each vehicle ca. € 1.000.
Results: lower risk of accidents and less environmental impact. Between '97 and 2000 -23% reduction of losses and -21% decrease of insurance premiums for vehicles and goods as well as a continuous reduction in fuel consumption.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/Therkelsen.pdf

6. *Driver Training for Improved Safety and Fuel Efficiency (Metzger Spedition GmbH)*

Aim: Improved safety and fuel efficiency. A driver training programme was initiated in 1997.
Method: All drivers took part in "economy" and "safe driving" classes. The training focuses on teaching drivers, even the most experienced, moderate driving methods and correct gearbox handling. Appropriate incentives were introduced to encourage and reward above-average economical and, thus, ecological driving behaviour.
Costs: The training costs in 1997 amounted to € 6.100, which is equivalent to € 120 per year for each of the 50 drivers who had to be trained.
Results: Fuel efficiency has increased by 12%. The company has saved a total of 30.000 litres in fuel. At the same time, CO2 emissions have been reduced by a total of 81.000 kg. The number of accidents has decreased by more than 8%.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/metzger.pdf

7. *Reduction of Accidents by an Internal Training Programme: "Challenge of the Day" (Nijman/Zeetank Holding BV)*

Aim: The company in question decided to develop internal training for logistic operations with the goal of achieving the highest possible level for this type of programme.
Method: Theoretical introduction, which can be quality/ safety/ environmental information and a legislation item (for example, the IMDG code). Background information on a customer, such as company organization; product information or Material Safety Data Sheet (MSDS). "Challenge of the day". This module is used to help participants learn from mistakes by examining case studies from actual company operations.

Costs: The course was written internally during office hours and consisted of a compilation of historical data, practice examples, etc. The total costs were about € 12.000 (200 hr at € 60/hr). The cost of the training itself is approximately € 2.500 per person.
Results: One result of the internal training programme is the 16% reduction in road accidents. Nevertheless, because of the overall reduction in road accidents, the company received an insurance rebate of some € 7.500. Integration of new employees has become a much easier task thanks to the internal training programme.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/nijman.pdf

8. Safe Loading and its Implications (Otto Görgens Spedition-Transportlogistik / Lübeck)

Aim: Training for safe loading of trucks was carried out within the context of certifying the company to the BGL label and ISO 9002 standards. All vehicles were equipped with improved load restraint systems. The company became involved in improving safety aspects because management decided to participate in a research group. The purpose of this group was to create guidelines for securing cargo.
Method: The following procedures are planned or have already been implemented in order to ensure that all participants adhere to the guidelines for secure and reliable loading of trucks: training and re-training for all drivers and loaders; provision of a sufficient quantity of load restraint systems; implementation of self-monitoring; development of application-oriented regulations for effective safe loading. An important part of this measure was to convince the drivers and loaders to pay more attention to securing cargo and to provide them with state-of-the-art load fastening systems.
Costs: The initial costs for training, monitoring and acquisition of load fastening systems amounted to € 3.600 in all. Annual recurring costs for training and material procurement will be approximately the same
Results: The positive effects are reduced fuel consumption resulting from optimized load distribution and avoidance of spillage of dangerous substances.
Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/gorgens.pdf

9. Reduction of Fuel Consumption supported by Monitoring (Transportes Campillo SA)

Aim: reduce fuel consumption by purchasing vehicles with automatic transmissions, driver training and the assignment of one driver as an instructor, and monitoring fuel consumption for each trip.
Method: creation of tables that analyse fuel consumption by route, type of vehicle and transported weight. In total, 49 tables have been established for routes to nearly every country in Europe, with each table containing data on three types of vehicle. Separate tables have been created to show the fuel consumption for each driver.
Costs: The cost of developing and maintaining the tables is difficult to quantify as this was still an ongoing process. Driver training cost about € 3.600 and was carried out by a technician from IVECO.
Results: A significant reduction in fuel consumption was achieved. This reduction was largely due to driver training and the purchase of vehicles with automatic transmissions. Relating information from the graphs with the recorded kilometres driven by each driver, the illustration shows that, between 1998 and 2000, while the total distance driven increased by 42.992 km, fuel consumption was reduced by 104.034 litres, equivalent to 4.19%.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/campillo.pdf

10. Reducing Accidents by Implementing a Safety Manual (Transportes Luís Simões)

Aim: TLS aims to improve working conditions by reducing accidents and promoting a high quality of life for its employees.

Method: developed a safety manual that defines and records the operations and procedures in use within the company. This manual is continuously updated and helps to ensure that all work sites use procedures that promote safety, health and hygiene. It also designates employees responsible for certain tasks and indicates when those tasks should be executed.

Costs: Although very difficult to quantify, direct cost benefits result from use of the safety manual: lower costs because of the reduction in injuries and incapacities; lower costs because of fewer operational failures; lower training costs for new employees.

Results: The safety manual promotes and protects the health of employees and results in fewer work-related accidents; improved quality of service; lower rate of absenteeism; improvement of the internal and external image of the company.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/simoes.pdf

11. Improved Efficiency through use of a Guidance and Communication System (VSV Frakt AB)

Aim: sustainable development by offering harvesting and transport systems that have a lower impact on the environment

Method: the introduction of an EMS and further increase the efficiency of its haulage work, the company has developed a computerized system for transport guidance and communication. The system is called TROMB (Transport Och Mobil Beordring, Transport and Mobile Instructions). TROMB supports mobile communications and consists of a Geographical Information System (GIS), Global Positioning System (GPS), e-mail and emergency alarms. Each mobile unit consists of a computer, keyboard, mouse, monitor, GPS receiver, Mobitex, DARC (Data Radio Channel) communication and an alarm. Mobitex is a wireless network architecture necessary to support wireless terminals. This system is the basis for: transport planning; the distribution of transport orders; direct mailing to the logging truck; alarms in case of accident.

Costs: cost is considerably higher than for a standard office computer. Each mobile unit costs about SEK 60.000 (€ 6.300) including mounting, accessories and antennas. The forestry research unit in Skogforsk nevertheless calculates that the system can be amortized in under two years.

Results: On the basis of an annual survey of all logging trucks, it is estimated that the TROMB system will reduce CO2, NOx, and particle emissions by 5% per transported tonne between 1998 and 2003. Information can easily be transferred between the mobile communication systems and the onboard units. This means that the logging trucks can operate over larger geographical areas and 24 hours a day. Also, the rate of returning cargo has increased. Telephone costs have decreased because of the e-mail system.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/vsv.pdf

12. *Driver Training for Improved Safety and Fuel Efficiency (Wullkotte & Hackmann Trucking & Transport GbR)*

Aim: driver training programme to improve skills appropriately

Methods: The drivers are responsible for determining their fuel consumption. Any irregularities are analysed immediately and possible causes are discussed. If extra maintenance is required, the schedule is checked to see of this can be programmed in

Costs: The training costs are € 610 per employee per year. This includes: training in safe and economical driving; training by specialists in transporting dangerous goods; training by specialists in occupational safety methods; training by company management.

Results: Based on an average of 145.000 km per driver per year, the costs for driver training are € 0.42/100 km. If the driver saves an average of 0.75 litres of fuel per 100 km through economical driving, then € 0.53/100 km is saved in fuel costs. The result is a cost advantage of € 0.10/100 km or € 151 per year.

Links/More information: IRU Best Practice Guide: http://www.iru.org/index/cms-filesystem-action?file=en_Best_Industry_Practices/wh.pdf

13. *Fuel Saving in a Scottish Haulage Fleet (John Mitchell [Grangemouth] Ltd / Freight Best Practice)*

Aim: reduce running costs of their fleet by investing in driver training, anti-idling policy and aerodynamics specification.

Methods: Driver training with the help of the Safe and Fuel Efficient Driving (SAFED) programme. For modern vehicles the cost of switching off the engine and starting up again is usually less than the cost of leaving the engine idling. Thus the company invested in an anti-idling campaign.

Costs: relatively low – driver education.

Results: 7% reduction in fuel consumption and CO_2 output and fuel costs saved in the amount of £ 274,089 through driver training. Anti-idling measures led to weekly savings of £ 700 per week.

Link/More information:
http://www.freightbestpractice.org.uk/default.aspx?appid=2000&fileid=936

Literature and useful links

(Availability checked 06/2009)

- Freight Best Practice website (includes various case studies and best practice documents) ➔ http://www.freightbestpractice.org.uk/default.aspx?appid=1948 (additions on a regular basis)
- IRU: Best Industry Practices
  - 1st issue of Best Practice document: http://www.iru.org/index/cms-filesystem-action?file=en_Publications/bip_2001-gb.pdf (2001)
  - 2nd issue of Best Practice document: http://www.iru.org/index/cms-filesystem-action?file=en_Publications/bip04.E.pdf (2004)
- BESTUFS – Best Urban Freight Solutions: Swedish project on Urban Freight best practices ➔ http://www.bestufs.net/
  - Reports available under BESTUFS I and BESTUFS II
- ETTAR project (Environmental Technologies, Training and Awareness-Raising) ➔ http://www.ettar.eu/results.html
- bestLog - Creating a Dissemination and Promotion Platform for Logistics Best Practice ➔ http://www.bestlog.org/index.php?id=226 (2009)
- Green Logistics – Research into the sustainability of logistics systems and supply chains ➔ http://www.greenlogistics.org/PageView.aspx?id=97
- Energy Saving Trust ➔ http://www.energysavingtrust.org.uk/business/Business/Transport-in-business
- European Environmental Agency – reports on transport best practices and activities of member states ➔ http://www.eea.europa.eu/themes/transport/reports
- On the Road to Climate Neutral Freight Transportation ➔ http://publikationswebbutik.vv.se/shopping/ShowItem 3623.aspx
- SAFED (Safe And Fuel Efficient Driving) ➔ www.safed.org.uk
- Transportation Energy Data Book (U.S. Department of Energy, published 2008) ➔ http://www-cta.ornl.gov/data/download27.shtml
- SmartWay (US Environmental Protection Agency) ➔ http://www.epa.gov/smartway/