



# The environmental efficiency of freight transportation

ADEME  
Department Transport & Mobility  
FRANCE  
gerald.lalevee@ademe.fr

[www.ademe.fr](http://www.ademe.fr)

# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**



# What is ADEME?

- French Environment and Energy Management Agency
  - industrial and commercial public agency
  - Under the joint supervision of:
    - Ministry of Ecology, Energy, Sustainable development and Spatial planning
    - Ministry of Higher Education and Research
  - 850 employees (including 360 engineers)

# ADEME's aims

- *to be the point of reference and privileged partner for*
  - companies
  - local and regional authorities
  - administrations
  - individuals
  
- *the State's tool to generalize the best practices designed to protect the environment and energy saving*

# ADEME's activities

- **Acquire Knowledge**
  - Orienting, managing and financing research programmes
  - Building and piloting observation systems
  
- **Convince and mobilize**
  - Inform and raise awareness
  - Information and training for professionals, companies, local authorities and national administrations
  
- **Advise and expertise**
  - Expertise serving the State
  - Dissemination of advisory services and market structuring
  - Developing practical tools, methods and disseminating best practices
  
- **Help in decision-making and to achieve projects**
  - Financial aid for decision-making
  - Direct subsidies for exemplary operations and projects
  - Facilitate mobilization of public and private funds
  - Structuring market supply

# Four domains of intervention

- **Energy and climate change**
  - Energy efficiency
    - Transportation
    - Building
    - Industry
    - Agriculture
  - Renewable energy and raw materials
- **Air quality and noise pollution**
- **Waste and soil**
- **Environmental management**

# ADEME and transportation

- The aim is to reduce in the transport sector:
  - energy consumption
  - greenhouse gases emissions
  - vulnerability in relation to petroleum products
- Actions oriented to :
  - passengers
  - goods
- With two approaches:
  - Technology of vehicles
  - organization



# PLAN

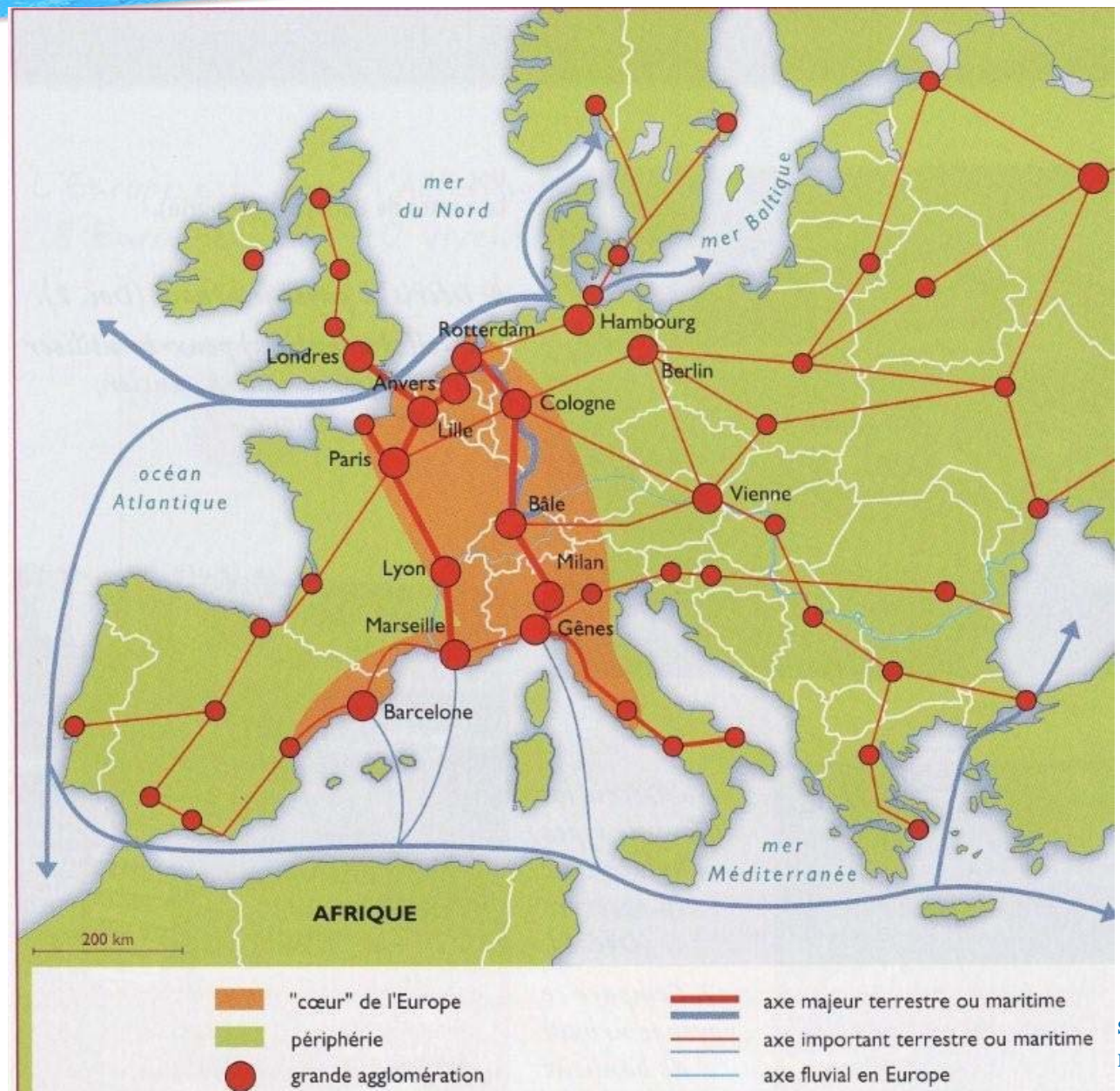
1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**



# The freight transport in Europe



- France is in the heart of the European traffics
- Between 1990 & 2006 in France:
  - +170% for the transit traffic (t.km)
  - +60% for the domestic traffic (t.km)
- Essentially captured by road



Source: Hachette éducation

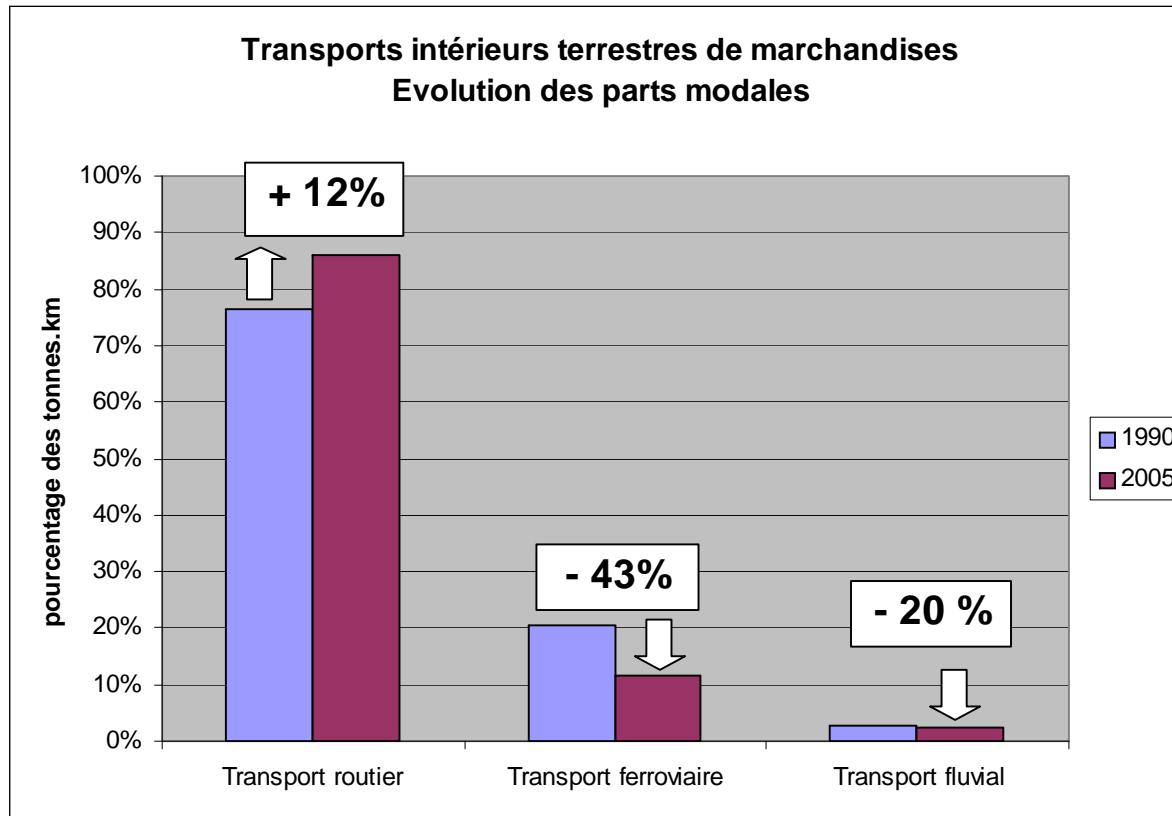


## Average daily lorries traffic in France

-  < 2000 lorries
-  2000-5000 lorries
-  5000-10000 lorries
-  > 10000 lorries

# The freight transport sector in France

Modal share	1990	2007
Road	77%	86,6%
Rail	20%	11,4%
Waterways	3%	2%



# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**



# The road haulage sector in France

## ➤ Represents around :

- 40 000 companies
- 640 000 lorries (maximum allowed mass (MAM) >3.5t)
- 340 000 employees

## ➤ Energy consumption :

- *Depends almost entirely on the gasoline*
- *French lorries consume annually 10 billion liters of gasoline*
- *The energy share in the costs of a road transport company can represent more than 25% (long distance). It was 16% 10 years ago.*

# Environmental impacts of road haulage

- French pollutants emissions declining thanks to the European regulation
- European emission standards for Heavy Goods Vehicle (MAM >3.5t) are imposed on vehicle manufacturers

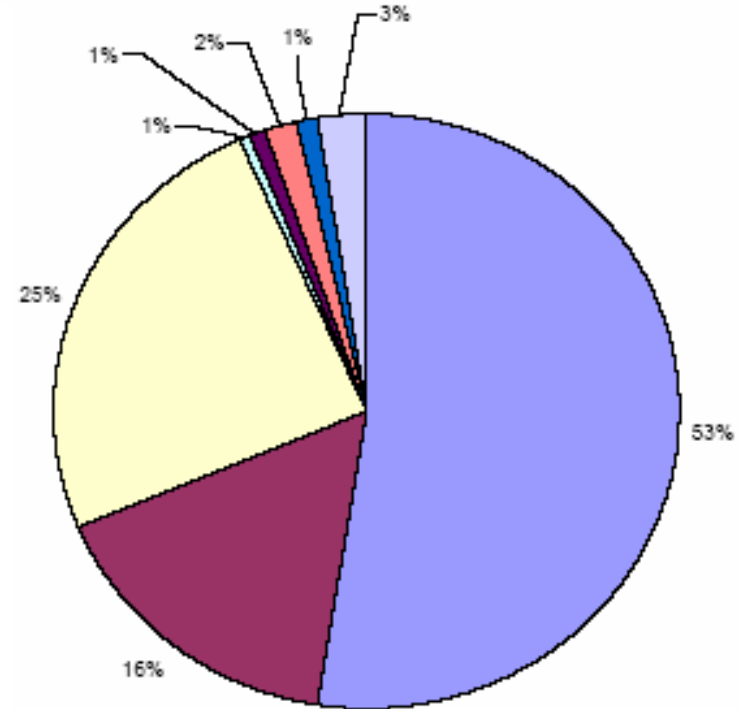
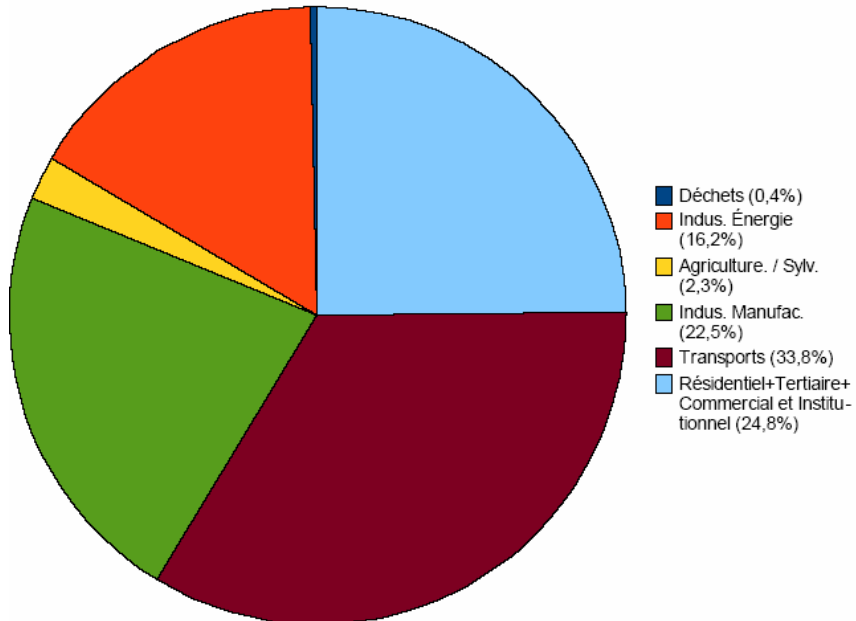
Euro norm emissions		Pollutants in (g/kWh)			
Standard	Date	CO	NO <sub>x</sub>	HC	PM
Euro 0	1990	12.30	15.8	2.60	none
Euro I	1993	4.90	9.00	1.23	0.40
Euro II	1996	4.00	7.00	1.10	0.15
Euro III	2001	2.10	5.00	0.66	0.10
Euro IV	2006	1.50	3.50	0.46	0.02
Euro V	2009	1.50	2.00	0.46	0.02
Euro VI					

NO<sub>x</sub> : nitrogen oxide  
 HC : hydrocarbons  
 CO : carbon monoxide  
 PM : particulate matter

- Moreover, the European commission directive called “Eurovignette” allows countries to have tolls or environmental taxes based on the euro norms emissions of the vehicles. In France the project to have an “Eco tax” based on the distance and the euro norms emissions is acted for 2011 (already applied in Switzerland, Austria or Germany)
- This regulation allows progressively to control air pollution despite the increase in traffic
- but does not act directly on CO<sub>2</sub> emissions (the main greenhouse gas)

# CO<sub>2</sub> emissions in France (2006)

**Transportation = first emission sector  
with 33,8% (CO<sub>2</sub>) and 26% (GHG)**



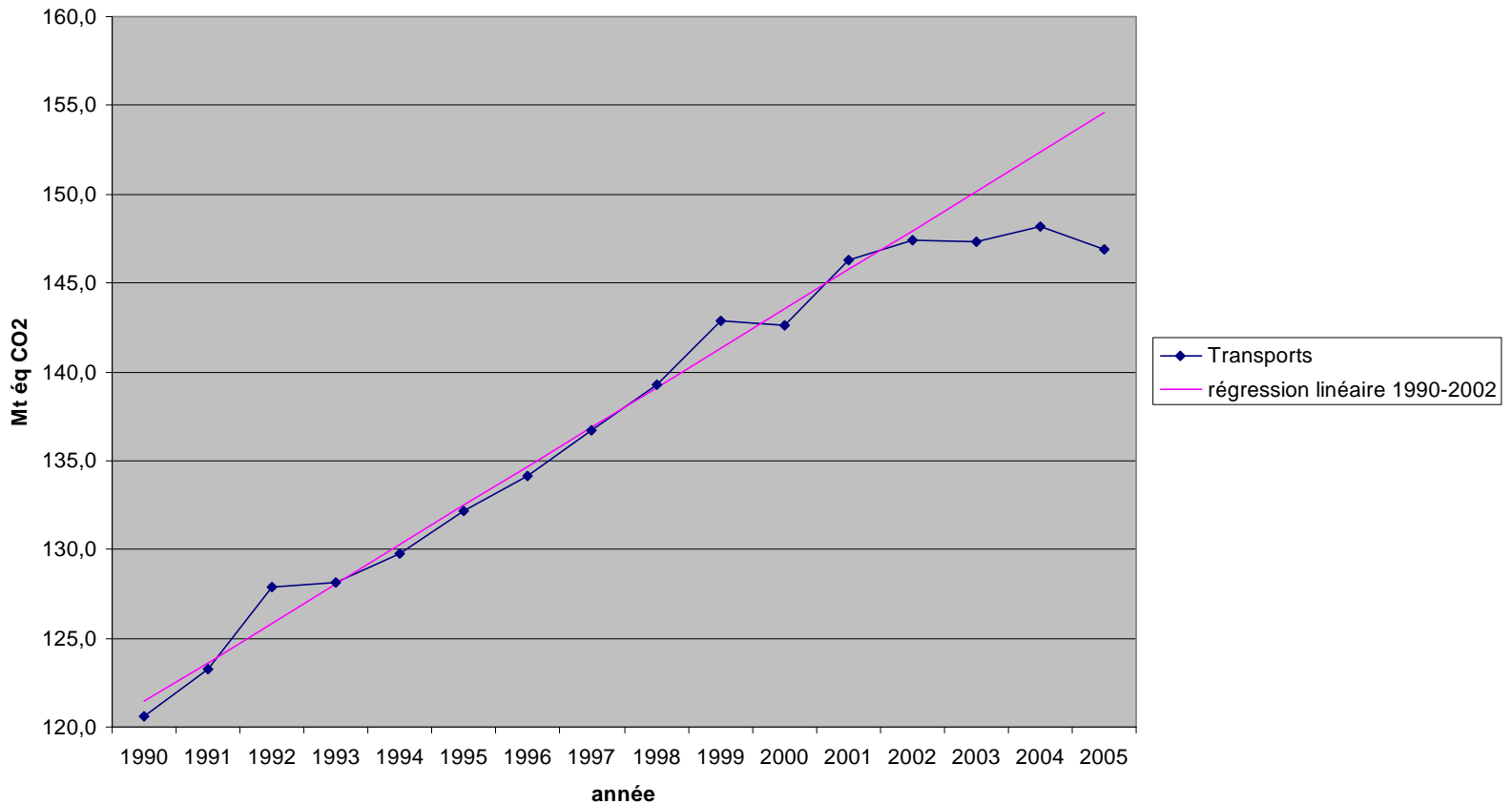
-  Passenger cars
-  Light commercial vehicles
-  Heavy Vehicles
-  2 wheels
-  Rail
-  Waterways
-  Maritime
-  Air



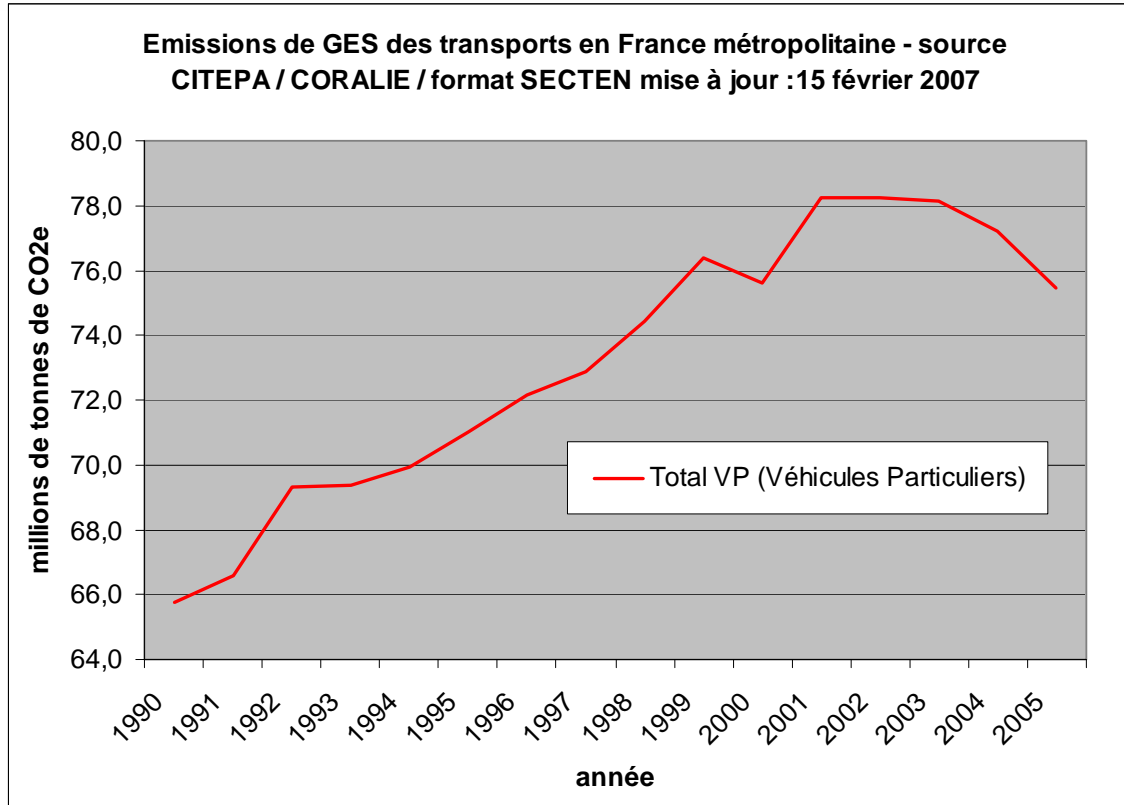
# Transports greenhouse gases emissions in France

## Goods and passengers

Emissions de GES directs au format PNLCC en France (MT+DOM)



# Evolution detailed Passenger cars

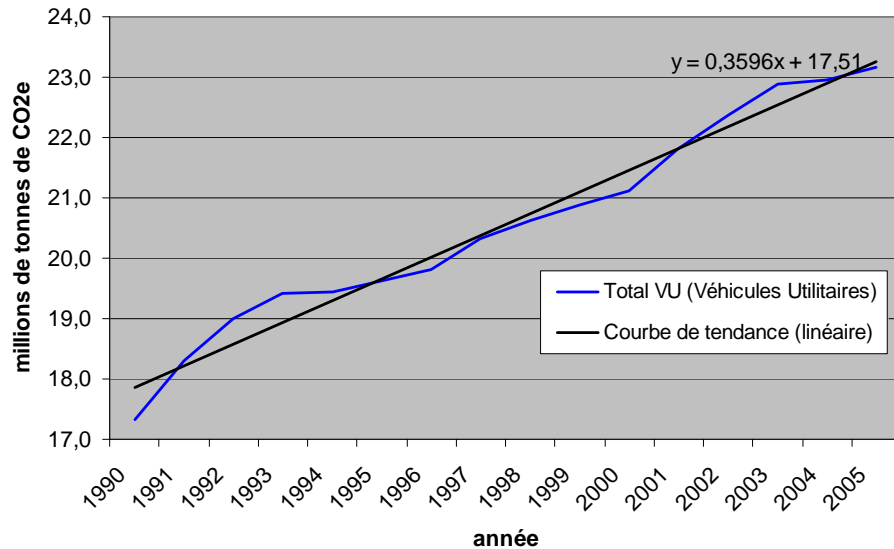


**+ 19% between 1990 & 2001**  
**- 4% between 2001 & 2005**

# Evolution detailed

## light commercial vehicles

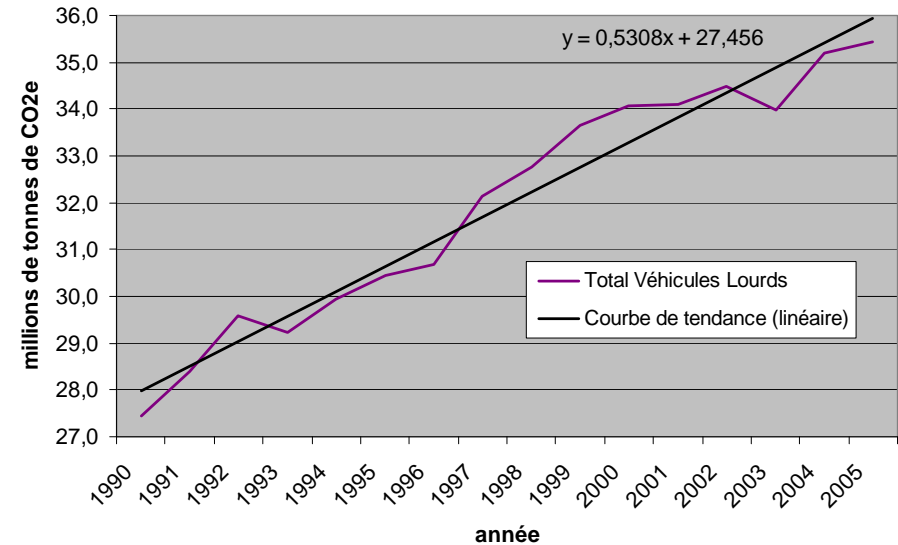
Emissions de GES des transports en France métropolitaine - source CITEPA / CORALIE / format SECTEN mise à jour : 15 février 2007



**+ 34% between  
1990 & 2005**

## Heavy Goods Vehicles

Emissions de GES des transports en France métropolitaine - source CITEPA / CORALIE / format SECTEN mise à jour : 15 février 2007



**+ 29% between  
1990 & 2005**

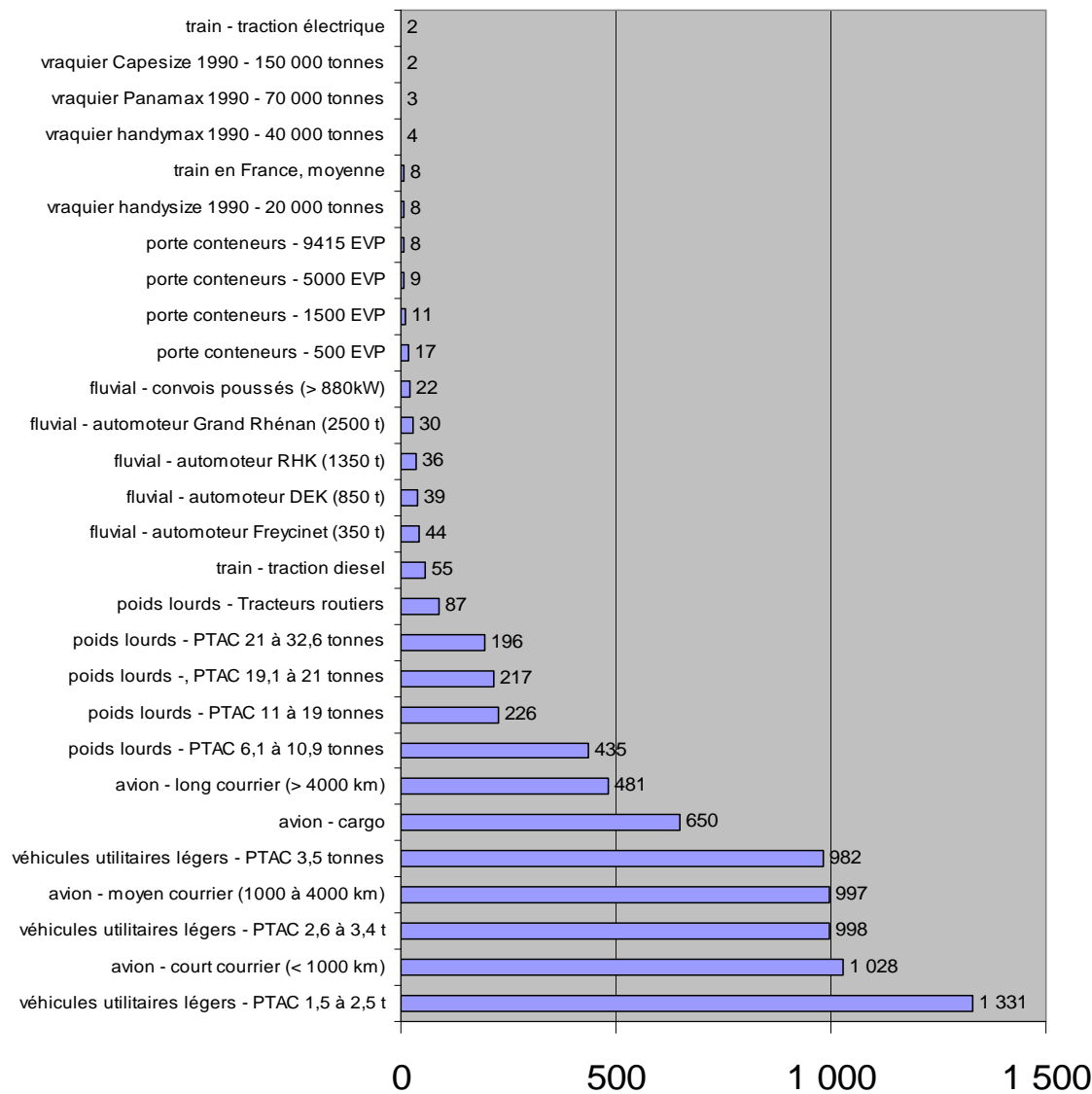
➤ The aim is to change the increased trend of the road haulage

# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transportation**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**

# Comparison of CO<sub>2</sub> emission unit for each mode of transportation

## comparaison des émissions de CO<sub>2</sub> par tonne.km



grammes de CO<sub>2</sub> par tonne.km





# Promote combined transports

Adresse: <http://www.viacombi.fr/>

OK Lists



## la plateforme web dédiée aux transports combinés

[Contact site](#) | [Abonnez vous à la liste de diffusion de Viacombi](#)

➤ **Soon : [www.viacombi.eu](http://www.viacombi.eu)**

[+ ajoutez aux favoris](#)

### S'INFORMER

mieux connaître le combiné

- Qu'est-ce que c'est ?
- Le combiné en images
- Techniques et matériels

adoptez la combinaison gagnante !

- Atouts du combiné
- Bonnes pratiques d'entreprises
- Profitez des aides

consultez l'offre

- Contacts Utiles
- Formations
- Plate-formes et réseaux

indicateurs clés

- voir les chiffres



### ACTUALITÉS

- entreprises -  
UPM met le papier en Seine
- manifestations -  
VNF Meetings
- politique transport -  
Autoroutes de la mer France-Portugal
- toutes les actualités

### DÉCIDER

**organisez votre transport**

Localisez les plateformes les plus proches de vos sites de chargement et de déchargement et déterminez votre trajet en combiné

- [accédez à l'offre](#)

**comparateur CO<sub>2</sub>**

Faites le bilan environnemental et comparez les temps de trajet entre une solution combinée et une solution routière depuis l'enlèvement de la marchandise jusqu'à sa livraison

- [accédez au comparateur](#)


[Partenaires](#) | [Nos engagements](#) | [Nous contacter](#) | [Mentions légales](#)



**BEST PRACTISE IN THE FIELD OF INTERMODAL TRANSPORT**

**TAB- DECATHLON**

**ACTORS INVOLVED**

Shipper : Décathlon



Forwarder : TAB



Operator : T3M



**NATURE OF THE PROJECT**

Type of CT: Rail/road

Sector of activity: specialized distribution

Type of goods: sport articles

Starting date: 2003

**ROUTE**



**ROUTE**



Saint Martin de Crau / Marseille  
75 km



Marseille / Valenton (rail transport)  
840 km



Paris towards Bussy Saint Georges or Brétigny-sur-Orge or Caen  
55 km (Bussy, Brétigny) , 230 km (Caen)

**CONTEXT OF THE INTERMODAL TRANSPORT**

**Operators and routes**

Saint Martin de Crau is the second largest Décathlon's continental warehouse (stacking area: 50,000 m<sup>2</sup>). TAB carries sport articles from Spain, Portugal and China where they are made. TAB is specialized in Road-Rail combined transport for the distribution industry. TAB operates, using its own swap bodies (700), a network with more than 200 units per day. It created in 2000, T3M (les transports du troisième millénaire), road-rail CT new operator.

Each day about 100 swap bodies are (un)loaded in Marseille Canet terminal. Trains linking Paris (Valenton) to Marseille are directly operated by T3M.

Presently, Décathlon is one of the main clients of TAB and its whole traffic between Marseille, Paris and Douges is carried by Road-Rail combined transport.

**Origin of the project**

Presently, Décathlon is one of the main clients of TAB and the whole traffic of the former between Marseille, Paris and Douges is carried by Road-Rail combined transport.

At the beginning, Décathlon had the possibility to test the service, while TAB committing itself to meet the standards of high quality of service.

**LOGISTICS AND TECHNICAL ORGANISATION**

**Description of transport chain**

Sport articles made in China are carried by sea to the port of Fos. Those made in Spain, Portugal, Italy and France are carried by road.

All the items are then gathered in the terminal of Saint Martin de Crau. Inland haulages from/to Marseille-Canet are provided by TAB, 6 days a week, 3 times a day (except to Caen).

In the terminal of Marseille-Canet, stevedoring is provided by Naviland Cargo. Swap bodies are transhipped on T3M trains thanks to 3 reach stackers. A single train can be loaded in 2h30. It is noteworthy that measures have been overtaken in order to reinforce safety on the site.

From Marseille-Canet, trains leave at 8 pm and arrive in Valenton at 6 am. 40% of the goods are then carried to Brétigny-sur-Orge, 40% to Bussy-St-Georges and 20% to Caen.

**Key elements**

Decathlon has demanded high quality of services from TAB: 95% of the required swap bodies must be delivered, 90% of reliability in loading delays and 95% of reliability achieved in the final deliveries.

Seasonality peaks are observed from November to December and then from April to September. Actually, TAB benefits from an increase in volume-absorbing capacity. Indeed, on one hand, TAB works for different companies having different seasonalities, and, on the other hand, TAB, calling for T3M, benefits from the controlling of railway and road supplies.



**Frequency:** 6 days a week

**Timetable:**

Marseille: 8 pm

Valenton: 6 am

**Distance:** 840 km

**Operation time:** 10h

**Equipment:** swap bodies

**ECONOMIC ASPECTS**

Total medium cost estimation (road transport base 100)



**KEY ELEMENTS**

- North-South bound: CT estimated cost is between 10 % and 20 % lower than road transport cost.
- A swap body costs between 7,000 and 8,000 €. TAB has benefited from monetary grants (20% of the total price) from ADEME, for buying swap bodies and chassis
- T3M benefits from a State aid to facilitate the operation

**ENVIRONMENTAL ASPECTS**

CO<sub>2</sub> emissions (tCO<sub>2</sub>eq/year)\*



\* data calculated from ADEME's carbon balance methodology for transport between Marseille and Valenton from January 2006 to December 2006.

**KEY DATA**

- Emissions avoided in tons of CO<sub>2</sub>: 770
- % of emissions avoided: 61 %
- Number of equivalent heavy vehicles avoided: 930
- Fuel consumption avoided: 290,000 l

**ADVANTAGES OF THE INTERMODAL SOLUTION**

Even if railway transport is less flexible than road transport, it offers great advantages:

- Transit time is shorter which enables Décathlon receiving earlier all the articles.
- Rail-road CT is safer and more secured (sport articles are high-added-value goods)
- CT is a good alternative to road transport mainly when the weather is bad and road traffic difficult

**LESSONS LEARNT**

To the forwarder, this service is reliable (reliability is reinforced by the strong links between TAB and T3M), fast, safe. Besides CT alternative is cheaper and benefits from volume-absorbing capacity. It is pretty interesting all the more so as the railway link is longer than the road link. Indeed, it enables the forwarder to depreciate transshipment fixed cost

To a certain extent reliability can be improved since railway transport had suffered from strikes and breakdowns.

In order to optimize the service, several bottlenecks have to be reduced:

- Connections between maritime and railway links should be improved.
- Increase the CT connections between France and Spain/Italy.
- Increase in the numbers of (un) loading points and in frequency. Indeed Bordeaux, Toulouse, Lyon and Perpignan demands in transport are very high but those cities are poorly connected.
- In order to offset the limited capacity of the railway network, TAB envisages to use 800 m trains.
- Reducing the transit time by 2 hours may enable earlier deliveries and then improve Decathlon selling in shops located far from the railway terminals.



# The environmental performance of road haulage

- The share of road transport in the flow of goods is dominant (and probably still remain for a long time)
- It must also concentrate on improving the intrinsic performance of road transport which determines the environmental performance of the whole transport system
- CO<sub>2</sub> is linked directly to the combustion of diesel (1 liter GO = 2.66 kg CO<sub>2</sub>)

# Control of fuel consumption in road haulage

- factors that influence the fuel consumption of a road vehicle
- tool for comparing fuel consumption

[www.energeco.org](http://www.energeco.org)



**Maîtrise des consommations de carburant dans le transport routier**

CRITÈRES DE PERFORMANCES    FACTEURS DE SUR-CONSOMMATION    RÉDUIRE SA CONSOMMATION    FORMATIONS

**Bienvenue sur energeco.org**

Le site consacré à la maîtrise des consommations de carburant dans le transport routier de marchandises.

Le ConsoComparateur d'Energieco vous permet :

- d'évaluer les performances de vos conducteurs
- de les comparer à ce qui se pratique dans le secteur
- de déterminer les gains d'une formation à l'éco-conduite.

**Au moins 3 bonnes raisons d'adopter une politique d'économie de carburant !**

- ECONOMIQUE** (réduire les coûts) €
- SOCIAL** (améliorer la sécurité routière) #
- ENVIRONNEMENTAL** (réduire le réchauffement climatique) ♻️

# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**

# The charter of voluntary commitments to reduce CO<sub>2</sub> emissions

- Target: road carriers (voluntary)
- Developed by the Ministry of Ecology and ADEME, in collaboration with the main professional organizations and 15 carriers
- This allows all voluntary transport companies to commit themselves on:
  - a personalized action plan
  - a reduction of their CO<sub>2</sub> emissions (fuel consumption)
  - for 3 years





# Conditions to sign the charter

➤ To sign the Charter of voluntary commitments, the company must meet the following conditions:

1. Having done a CO<sub>2</sub> diagnosis in the aim of making an inventory of its situation (baseline)
2. Identify at least one indicator of environmental performance specific to the company (such gCO<sub>2</sub>/t.km) with a goal of reducing to 3 years
3. Set an action plan over a period of 3 years developed around four axis: the vehicle, fuel, driver and the organization of transport flows
4. Choose at least one action per areas

➤ To validate the signing of the charter other more qualitative elements can be considered such as:

1. Human resources that the company intends to deploy to guide and implement the internal action plan
2. The method of measuring and monitoring fuel consumption used

# The specific tools & guides

The approach relies on the tools and methodological guides following:

1. The general guide of the process
2. Specifications on the CO<sub>2</sub> diagnosis and monitoring of action plan
3. An Excel spreadsheet "voluntary commitments" with its user guide.  
This tool, structured around 9 tabs, permits, after the seizure of data of business to:
  - evaluate and monitor its CO<sub>2</sub> emissions on the perimeter chosen
  - assess the gains in terms of fuel consumption and CO<sub>2</sub> emissions by potential actions chosen
  - follow the progress of objectives
  - follow the time environmental indicator(s) of performance.
4. A series of "action cards" that includes the average gains through CO<sub>2</sub> potentially expected (for helping with decision)

# The proposed actions

<p>Axis 1 Vehicle</p>	<p>Accelerate the modernization of the fleet Clamping engine to reduce the maximum speed of vehicles Use of synthetic lubricants Using accessories to reduce aerodynamic resistance Improving vehicle maintenance Using tires to reduce energy consumption Air conditioning: limiting its use and modification of technology Using gear robotic</p>
<p>Axis 2 Fuel</p>	<p>Improved management and monitoring of fuel consumption Using alternative to diesel fuel (Ethanol, Biodiesel30, electric, hybrid, diesel water emulsion, natural gas vehicle)</p>
<p>Axis 3 Driver</p>	<p>Restrictions on the use of the engine switched off Driver training eco-driving Dissemination of good conduct Establishment of incentives</p>
<p>Axis 4 organization of transport flows</p>	<p>Increased use of non-road modes Acquisition or better use of tools to traffic and fleet management and optimize routes Improved load factor and limitation of empty runs Negotiating with clients of measures to better optimization Raising awareness among subcontractors Display CO<sub>2</sub> transfers to customers</p>





# The voluntary commitments: a structured approach for companies

- Acting on CO<sub>2</sub> emissions is to act on fuel consumption (about 25% of the costs of a carrier today)
  - forces to have dashboards with data and indicators that were not necessarily followed earlier (gives method)
  - Source of motivation for employees (management tool)
  - Allows to answer demand from their customers (shippers) for reporting CO<sub>2</sub> emissions generated by their transport and to answer some tenders
- But, signing the charter is not a label. The company shows just the fact that it is committed on reducing its CO<sub>2</sub> impact, but it does not give the real company performance level

# Towards an environmental labeling of transport enterprises

- We are working on a future environmental label for:
  - Rewarding companies that have a level of environmental performance above average (to give a competitive advantage)
  - Graduating them according to their level of performance (with scores for example)
- The precise specifications with referenced criteria have to be defined

# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**

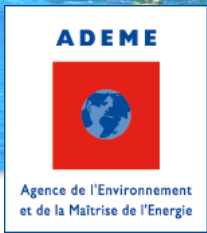
# The environmental performance of supply chains: the role of shippers

- Carriers respond to a request generated by shippers (manufacturers, distributors...)
  - The overall environmental performance of transport depends also on their ways of organizing supply chains :
    - concentration and globalization of businesses
    - centralization of traffic flows of goods and polarization logistics
    - integration of logistic processes in production systems with the use of just in time
    - the use of tools and technology collaboration / sharing logistics
    - the development of logistics direct deliveries to customers
    - the development of reverse logistics
    - increased use of road transport compared to other modes
    - reducing packaging, ...
  - ADEME :
    - shares experiences with in working groups of shippers on these topics
    - finances research projects (sharing logistics...)
- ⇒ Project to integrate shippers in the charter of voluntary commitments to reduce CO<sub>2</sub> emissions

# PLAN

1. **ADEME**
2. **The freight transport in France**
3. **Energy and environmental impacts of freight transport**
4. **The environmental performance of transport**
5. **The Charter of voluntary commitments to reduce CO<sub>2</sub> emissions from road carriers**
6. **The environmental performance of supply chains: the role of shippers**
7. **Need for environmental performance indicators**

# Need for environmental performance indicators



- Objective in France: make the display of CO<sub>2</sub> emissions from transport services on a support like the bill
- Purpose: to inform purchasers (shippers) on CO<sub>2</sub> emissions related to transport flows they produce in order to have :
  - a baseline
  - choice eventually the most performing carriers
  - implement reduction measures
- For the moment: the evaluation of the CO<sub>2</sub> transport emissions service is based on average emission factors that do not reflect the reality of the carriage
- Calculation methods have been developed by modes and type of distribution
- Experiments with volunteers carriers are planned in 2009 for an effective implementation in 2010



⇒ CO2 : new criterion for choosing transport services and carriers next to the price and quality of service ?





# Thank you for your attention

Gérald Lalevée  
ADEME  
Department Transport & Mobility  
FRANCE  
[gerald.lalevee@ademe.fr](mailto:gerald.lalevee@ademe.fr)

[www.ademe.fr](http://www.ademe.fr)