

## RAPPORT:

# POLICIES FOR REDUCING GHG-EMISSIONS FROM ROAD TRANSPORT IN FRANCE

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## Contents

1. A short summary of national policies for reducing GHG-emissions from road transport in France .....	4
Taxation of fuels .....	4
Taxation of vehicles.....	5
Registration taxes (bonus/malus registration tax).....	5
Yearly vehicle tax .....	5
Company vehicle fleet tax (TVS) .....	5
Biofuel policy .....	6
Policies concerning electrification.....	7
Vehicle energy efficiency .....	7
Other concrete measures .....	8
2. Programs and policy measures of international importance .....	9
Bonus/malus registration tax.....	9
3. Private sector and/or local government initiatives .....	13
Contributions to electric bikes .....	13
Mobility management .....	13
Versement Transport.....	14
Parking policies.....	16
Promotion of eco-driving.....	16
Restrictions on new shopping centres .....	16
4. Research programs.....	17
ADEME (French Environment and Energy Management Agency) .....	17
LET (Transport Economics Laboratory) .....	17
PREDIT (programme of research, experimentation and innovation in land transport) .....	17
IFFSTTAR (The French institute of science and technology for transport, development and networks) .....	17
CERTU (Research agency network on Transport, Land use and Public construction) .....	18
5. Interesting proposals that have not (yet) resulted in government policy or action	19
Kilometre tax for trucks in 2013 .....	19
Congestion charges .....	19
Low emissions zones project .....	19



6. Contact details of relevant government commissions/committees and of academia/think-tanks of interest .....21

    The bonus / malus system .....21

    Mobility management (PDA/PDE).....21

    Low emissions zones (ZAPA) .....21

    Versement transport.....21

## 1. A short summary of national policies for reducing GHG-emissions from road transport in France

France is, through its commitment to the Kyoto Protocol and to the European Union's Climate and Energy Package (from 2009), committed to reduce its greenhouse gas emissions with 14% by 2020 compared to 2005. The long term goal is to reduce emissions with 75% by 2050 compared to 2005. France is investing intensively by mobilising all sectors (transport, building, energy, industry, agriculture etc.) towards a new green growth model based on low CO<sub>2</sub> emissions and energy consumption.

The French Climate Plan for 2004-2012 has the goal of reducing CO<sub>2</sub> emissions to the 1990 levels by 2012. More specific measures were developed in workshops that led to the Environment Round Table Commitments (called the "Grenelle 1 Act" 2009), which was an initiative to bring different stakeholders together to identify measures to reduce CO<sub>2</sub> emissions<sup>1</sup>. This Round Table Commitment is composed of 57 measures to deal with climate change. In 2010, a second Environment Round Table Commitment developed (the "Grenelle 2 Act" 2010) these measures further.

The transport sector represents about 26 % of the CO<sub>2</sub> emissions in France. CO<sub>2</sub> emissions increased by about 22 % between 1990 and 2001, and they have remained stable since then. The Environment Round Table Commitments identify a range of measures to reduce CO<sub>2</sub> emissions within the transport sector. The goal is to reduce these emissions to the 1990 level by 2020<sup>2</sup>.

However, the long term plans are established by local authorities (Climate and energy territorial package) such as Paris ([Climate Plan 2020](#)), "Grand Lyon" ([Vision 2020](#)) and "Grand Toulouse" ([Climate plan 2012-2020](#)).

### Taxation of fuels

The fuel price in France is subject to two taxes, the VAT (percentage of the crude price) and the TICPE (domestic consumption tax on energy products, fixed price per volume unit). The TICPE is not subject to VAT.

The domestic consumption tax on energy products (TICPE) replaced the domestic consumption tax on petrol products (TIPP) in 2011 in order to include biofuels and the electrification of transport. The TICPE is charged in addition to VAT (but calculated on the price without VAT) and it has different fixed values according to the energy type of the fuel. In 2012 the tax rate was:

- 0.6069€ per liter for gasoline
- 0.4284€ per liter for diesel.<sup>3</sup>
- 0.1729€ per liter for biofuel E85<sup>4</sup>

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<sup>1</sup> It brought together representatives from the state, local governments, trade unions, businesses and environmental protection organisations.

<sup>2</sup> The French Climate Plan (2009), page 11-12, accessible at: [http://ec.europa.eu/environment/networks/greenspider/doc/climate\\_change\\_campaigns/ccc\\_france.pdf](http://ec.europa.eu/environment/networks/greenspider/doc/climate_change_campaigns/ccc_france.pdf), accessed on the: 2013-01-20.

<sup>3</sup> Each region can increase this tax by respectively 73 and 135 cent for 100 liter of gasoline and diesel.

- Electric vehicles are exempted from tax.

This tax policy is deemed to reduce CO<sub>2</sub> emissions, as diesel vehicles emit less CO<sub>2</sub> than gasoline vehicles. The overall effect on CO<sub>2</sub> emissions of this policy is however less evident, as lower taxes on diesel may induce more traffic. The suitability of stimulating diesel engines as a means to reduce GHG emissions is now being questioned, due to the higher particle emissions from diesel vehicles (see chapter 5 on low emissions zones). For the moment, there is no TICPE tax on electric vehicles in France. However, the purpose of the TICPE tax was to make electricity subject to this tax. For the moment, different practical problems concerning how to collect such a tax are discussed.

## Taxation of vehicles

There are mainly three different tax systems concerning vehicles in France; one that concerns all vehicles (registration tax), one for private vehicles (yearly tax) and one that concerns company cars. A brief description of the tax systems is described below.

### Registration taxes (bonus/malus registration tax)

A bonus/malus car registration tax was implemented in France in January 2008. The system provides a bonus (a subsidy) for the purchase of a low emitting vehicles and a malus (a charge) for the purchase of a high emitting vehicles. The bonus/malus system is only applied on newly registered vehicles but concerns both company and private owners. Details are provided in chapter 2.

### Yearly vehicle tax

France has a yearly vehicle tax since January 2009, which is charged in addition to the bonus/malus tax. The owner of a vehicle with high CO<sub>2</sub> emissions is charged 160€. In 2009 the tax was only charged for vehicles that emitted more than 250 grams of CO<sub>2</sub> per km. Since then, the threshold for the tax has been reduced to 190 grams of CO<sub>2</sub> per km for vehicles registered in 2012. This tax provides long term incentives for vehicle owners to purchase low emitting vehicles.

### Company vehicle fleet tax (TVS)

The company vehicle fleet tax (TVS) is a yearly tax, which is charged to companies and is calculated according to their vehicle fleets' CO<sub>2</sub> emissions. In order to favour low emitting vehicles, a two year tax exoneration has been established for vehicles using electricity, liquefied petroleum gas (LPG), natural gas (NGV) or super ethanol (E85).

The tax is charged for each gram of CO<sub>2</sub> emitted by the vehicle per km and the price per gram depends on the CO<sub>2</sub> emission classification described in Table 1. As illustrated in table 1, this calculation system is not linear. For example, a company has

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<sup>4</sup> In 2007 (when E85 was introduced in France) the TIPP on E85 was at 0.3343€ per liter. France has been granted an exemption from the ETD-directive.

to pay 440€ for a vehicle emitting 110g of CO<sub>2</sub> per km and 1725€ for a vehicle emitting 150g per km.

The company vehicle fleet tax favours the purchase of vehicles with diesel engines to those with gasoline engines, as the CO<sub>2</sub> emissions are lower for diesel vehicles than gasoline vehicles (for an equivalent vehicle power).

CO2 emission (gram per kilometer)	Tax per CO2 gram (€)
$x \leq 100$	2
$100 < x \leq 120$	4
$120 < x \leq 140$	5,5
$140 < x \leq 160$	11,5
$160 < x \leq 200$	18
$200 < x \leq 250$	21,5
$x > 250$	27

Table 1: Company fleet tax calculation; x stands for CO<sub>2</sub> emissions in gram per kilometre<sup>5</sup>

## Biofuel policy

Following the European directive (2009/28/CE, 23 April 2009), which sets the objective of 10% sustainable energy in the transport sector by 2020, France started a biofuel development program. This national program fixed ambitious objectives to incorporate biofuels mixed with traditional fuels (diesel and gasoline). In 2005 the traditional fuels were mixed with 1.2% biofuels, and the objective with the program was to increase the share of biofuels in the mix to 7% in 2010<sup>6</sup>. In 2010 the share of biofuels in the fuel mix was 6.8%. The objective for 2015 is to have a 10% share of biofuels in the mix.

A gradually decreasing tax, which is calculated according to the amount of biofuels mixed with traditional fuels, has been established for fuel distributors. The purpose of the tax is to increase the amount of biofuels in the fuel mix. Moreover, a tax deduction is provided, in accordance with the European directive 2003/96/CE, for biofuel produced according to sustainability criteria.

A “superethanol” E85 (which contains 65 to 85% biofuel) is allowed in France since the 1<sup>st</sup> of January 2007. In order to promote this new fuel, the French government committed itself to set up 500 E85 filling stations before the end of 2007. However, only 300-350 E85 filling stations were available in the beginning of 2013.

<sup>5</sup> Source: [impots.gouv.fr](http://impots.gouv.fr)

<sup>6</sup> Article 48 of the [Agricultural Orientation Act](#) (2006): objectives of biofuels share in transport are 7 % in end of 2010 and 10 % in end of 2015

## Policies concerning electrification

The purchase of newly registered electric cars is subsidised through the bonus/malus system as explained in chapter 2. The bonus for buying such a vehicle is about 7000€ (with a maximum of 20% of the vehicle price).

In April 2010, the French government established a charter with 12 territorial collectivities (Bordeaux, Grenoble, Rennes, Nice, Angoulême, Pays d'Aix-en-Provence, Orléans, Paris, Rouen, Strasbourg, le Havre et le Grand Nancy) and two vehicle manufacturers (PSA, Renault). The purpose with the charter was to develop and install battery charging stations for electric vehicles. These collectivities are pilots, and the charging stations are deployed and tested in areas with different city characteristics. The charging stations will be deployed all over France at a later stage.

Each partner's responsibility is described below:

- The French state is responsible for operational recommendations concerning the deployment of infrastructure as well as for the details on possible financial support
- The territorial collectivities are responsible for the deployment of the battery charging stations
- The vehicle manufacturers have stated that they will be able to produce 60'000 electric vehicles within the period 2011-2012<sup>7</sup>.

The French objective is to have about 75'000 public and 900'000 private battery charging stations in place by 2015<sup>8</sup>. This number should increase to 400'000 public and four million private battery charging stations by 2020.

Furthermore, a national development plan for clean vehicles was adopted in April 2010. This plan defines regulations for establishing battery charging stations in new private buildings from 2012 and onwards. The plan also establishes regulations for the implementation of charging stations in office buildings until 2015.

## Vehicle energy efficiency

Two measures to stimulate vehicle energy efficiency are:

- The "bonus/malus" system, which stimulates more energy efficient vehicles (see chapter 2 for a description).
- A tyre labelling policy. The application of the European policy CE n°1222/2009 started in November 2012 (a policy regarding tyre labelling). The information that will be available through this policy will provide incentives for consumers to purchase more efficient tyres, which leads to reduced energy consumption as well as reduced GHG emissions.

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<sup>7</sup> As of yet, no evaluations of the outcome is available (that the author of this paper is aware of). In 2012, 9 300 electric vehicles were sold in France.

<sup>8</sup> According to The European Association for Battery, Hybrid & Fuel Cell Electric Vehicles ([Avere](#)) which conducted data collection in summer 2012, France has 1600 public charging plugs and 53 fast charging infrastructures.

## Other concrete measures

- The “versement transport” is a local tax, which can be charged on the gross salaries of all companies with more than nine employees within certain areas. The tax is used to improve and finance the running costs of the public transport network. Details about the policy are provided in chapter 3.
- Companies (both public and private) must offer their employees a 50% subsidy on the public transport card as well as on the subscription to local rental bikes (e.g. the Vélib system in Paris), provided that the employees use these transport modes on a daily basis. This subsidy is exempt from taxes, both for employees and for the employer. The purpose with the subsidy is to promote commuting by public transport and bike.
- The main objective with the Environment Round Table Commitments from August 2009 (“Grenelle de l’environnement”) is to reduce the GHG emissions. Among the proposed measures for the public transport network for 2020 are:
  - Develop freight transport by sea and train
  - Develop the tramway network from 329 km to 1800 km outside of the Paris Region. The costs for this measure is estimated to 18 bn€, and the participation from the state is set to 2.5 bn€.
  - Develop the high speed train network with 2000 additional km. The costs for this measure is estimated to 16 bn€

## 2. Programs and policy measures of international importance

### Bonus/malus registration tax

A bonus/malus system was implemented in France in January 2008. The system provides a bonus (a subsidy) for the purchase of a low emitting car and a malus (a charge) for the purchase of a high emitting car. The bonus/malus system is only applied on newly registered cars. Details are provided in table 2 and table 3. These tables contain information about the development between 2008 and 2013.

The interval for the neutral class (which neither receives a bonus nor a malus) was between 130 and 160 g/km in 2008. In 2013 this interval had been reduced to between 106 and 135 g/km. The levels for 2014 will be announced in 2013 and will depend on technologic development, on requirement for a financial equilibrium and on objectives to be achieved in the mid-long term.

This tax/subsidy is only applied on newly registered cars and the purpose is to encourage people to choose more environmentally friendly cars. It is supposed to be neutral on public finances (i.e. the cost of subsidies is supposed to be covered by the fees).

**Table 2: Malus (€) for new registered vehicle**

CO <sub>2</sub> gr/km	2008	2009	2010	2011	2012	2013
136-140	0	0	0	0	0	100
141-145	0	0	0	0	200	300
146-150	0	0	0	0	200	400
151-155	0	0	0	200	500	1000
156-160	0	0	200	750	750	1500
161-165	200	200	750	750	750	1500
166-175	750	750	750	750	750	1500
176-180	750	750	750	750	750	2000
181-185	750	750	750	750	1300	2600
186-190	750	750	750	750	1300	3000
191-195	750	750	750	1600	2300	5000
196-200	750	750	1600	1600	2300	5000
201-230	1600	1600	1600	1600	2300	6000
231-240	1600	1600	1600	1600	3600	6000
241-245	1600	1600	1600	2600	3600	6000
246-250	1600	1600	2600	2600	3600	6000
>250	2600	2600	2600	2600	3600	6000

**Table 3: Bonus (€) for new registered vehicle**

CO <sub>2</sub> gr/km	2008	2009	2010	2011	2012	aug-2012
≤20	5000	5000	5000	5000	5000	7000
21-50	5000	5000	5000	5000	5000	5000
51-60	5000	5000	5000	5000	3500	4500
61-90	1000	1000	1000	800	400	550
91-95	1000	1000	1000	400	100	200
96-100	1000	1000	500	400	100	200
101-105	700	700	500	400	100	200
106-110	700	700	500	400	0	0
111-115	700	700	500	0	0	0
116-120	700	700	100	0	0	0
121-125	200	200	100	0	0	0
126-130	200	200	0	0	0	0

However, due to the success of the policy and to some of the design features of the scheme (for instance, the large interval for neutral classes), the system had a financial deficit of 214 M€ in 2008, 522 M€ in 2009, 521 M€ in 2010 and 198 M€ in 2011. In total, the deficit between 2008 and 2011 amounted to 1.46 b€. However, in 2012, the

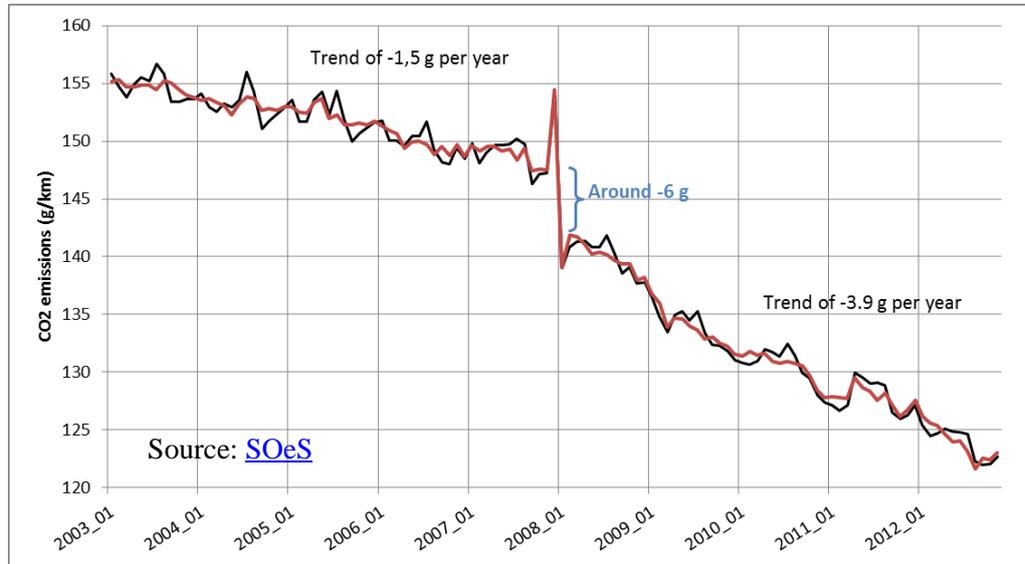
bonus/malus showed a positive financial result for the first time (+0.8 M€ according to preliminary results).

The administrative cost of the bonus/malus system is estimated to 2.3 M€ per year. The administration cost includes (source: Willy Breda, see chapter 6):

- processing of around 450 000 applications per year,
- management of an online platform where car distributors can register applications for bonus reimbursement and for malus payment<sup>9</sup>,
- control operations such as controlling the applications and decide if subsidies are granted (or not) and if deductions should be given (ex: reduction for families, see next paragraph).

Families receive a deduction from the malus of 20 g/km per child (from the third child). This deduction was implemented in 2009. Biofuel (superethanol E85) vehicles have also a deduction in case of a malus (a 40% CO<sub>2</sub> emission reduction if the initial emissions are lower than 250 g/km). Finally, hybrid vehicles have a specific bonus of 4'000€ (2'000€ prior to August 2012) if they emit less than 110g/km.

In Figure 1, the average CO<sub>2</sub> emissions (g/km) for newly registered vehicles are presented between 2003 and 2012. The black curve contains raw data, while the red curve is corrected for seasonal variation. The direct effect of the “bonus/malus” system has been estimated to a 6 gram reduction of newly registered vehicles’ CO<sub>2</sub> emissions per kilometre. In addition, the yearly reductions of the bonus/neutral/malus intervals have contributed to a more rapid CO<sub>2</sub> emission reduction trend for newly registered vehicles than before 2008 (3.9 g/year against 1.5 g/year). The average CO<sub>2</sub> emissions of newly registered vehicles in France are below 130 g/km since 2011 (i.e. the European objective for 2015<sup>10</sup>). Furthermore, if this trend continues until 2020, the long-term European objective of 95 g/km should be reached.



<sup>9</sup> Car distributors can choose to take over the responsibility for the bonus/malus application process and thus include the charge/subsidy in the payment.

<sup>10</sup> Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO<sub>2</sub> emissions from light-duty vehicles

Figure 1: CO<sub>2</sub> emissions average in g/km for new vehicles per month

Figure 2 illustrates the composition of newly registered vehicles before the introduction of the bonus/malus system (in 2007) and the trend after the implementation (in 2008 and 2009). The neutral class included vehicles with CO<sub>2</sub> emissions between 130 and 160 g/km. The proportion of vehicles with malus was reduced from 21% in 2007 to 12% in 2008 and 8% in 2009. Vehicles that emit less than 120 grams of CO<sub>2</sub> per km represented 52% of the newly registered vehicles in 2009 compared to 20% in 2007.

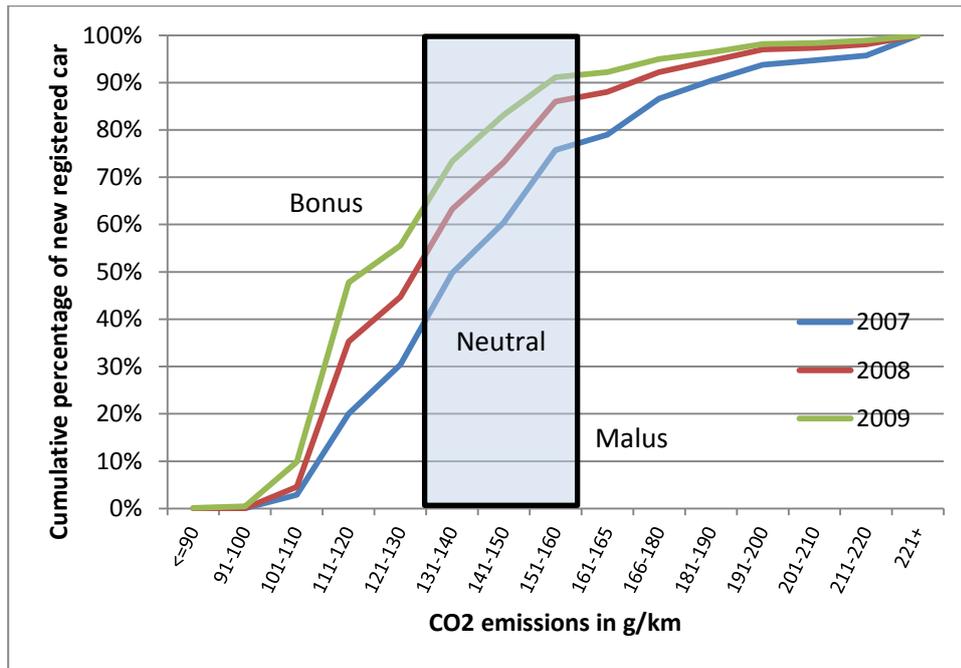


Figure 2: Distribution per class of CO<sub>2</sub> emissions of new registered vehicles

The average purchase price of newly registered vehicles (without taking into account any subsidies/fees from the bonus/malus system) decreased by 5% (see figure 3) between 2007 and 2008, whereas the average purchase price previously had increased continuously since 2001. From 2008, the average purchase price started to increase again<sup>11</sup>. It is difficult to isolate the impact from the bonus/malus system from the effects provoked by the financial crisis (the number of newly registered cars have remained stable between 2007 and 2008).

Finally, the composition of the total car fleet in France has changed between 2007 and 2009. 46.8% of the French car fleet was composed by small vehicles in 2009, compared to 45.3% in 2008 and 44.5% in 2007. Furthermore, the share of premium and mid-range cars decreased from 19.4% in 2007 to 17% in 2009.<sup>12</sup>

<sup>11</sup> Source: [largus.fr](http://largus.fr)

<sup>12</sup> Source: Automobile French manufacturers comity (CCFA)

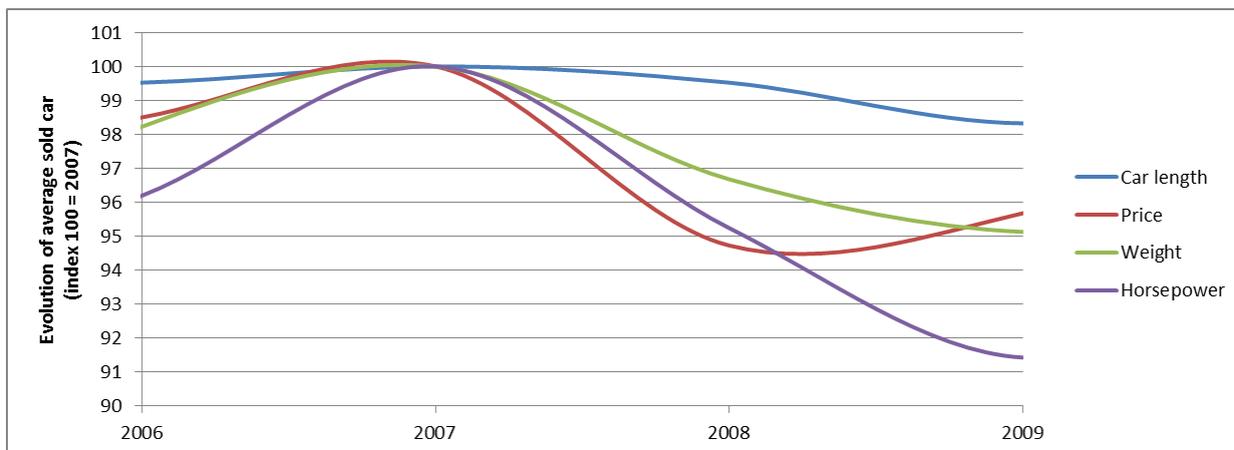


Figure 3: Evolution of the average new registered car per year between 2006 and 2009

### 3. Private sector and/or local government initiatives

#### Contributions to electric bikes

Local public authorities (communes, group of communes) promote the use of bikes by subsidizing the purchase costs of an electric bike. This benefit is not subject to income taxes. An electric bike distributor listed 92 public authorities that provide this subsidy, but the exact number of authorities providing this subsidy is not known (some offers may have expired while others are unknown).

The subsidies vary from 20 to 50% of the purchase price of the bike, with a maximum limit for the subsidy and sometimes with a limited number of subsidies per year. For instance, the Toulouse conurbation has been providing subsidies during three consecutive years, with a 25% subsidy of the price, limited to 250€ per person. Another example is the Chambéry conurbation which, for the 4<sup>th</sup> consecutive year, subsidises 25% of the purchase price of an electric bike. This latter subsidy is limited to 150€ per person and it is only provided to households with low incomes.

#### Mobility management

The French state is encouraging travel plans for public administrations (PDA), companies (PDE and PDIE) and schools (PDES). The French Environment and Energy Management Agency (ADEME) provides financial and technical assistance to institutions that are willing to implement a travel plan. The maximum financial contribution is fixed to 50% of the plan establishment and to 30% of the cost of the first implemented measures.

In the Climate Plan 2004 -2012 (updated in 2006) it is stated that each state administration, situated in a conurbation with more than 100'000 inhabitants, must establish a travel plan within two years. Furthermore, the Bouches-du-Rhône department and the conurbation of Grand Avignon have made travel plans (PDE) compulsory for companies with more than 250 employees (through their air protection plan). Conurbations that revise their air protection plan nowadays tend to include PDE.

The Ile-de-France (Paris) region also has specific rules that oblige large traffic generating areas to establish travel plans. Apart from these cases, travel plans for schools and companies are not compulsory, but they are strongly encouraged through the urban transport plans (PDU).

The aim with a travel plan is to reduce the environmental, financial and social impact provoked by an institutions' transport, especially from the use of private vehicles. The travel plans take into account trips generated by employees, visitors and deliveries. In order to do this, measures to favour sustainable transport instead of private vehicles are established.

Even though establishing a travel plan has a cost for the institution, the return on investment is high. The travel plan can, apart from reducing CO<sub>2</sub> emissions, improve the accessibility and transport safety, contribute to a better working environment and valorise the institution's image. Travel plans can also reduce the institution's costs for business trips.

Examples of measures are multiple, such as the creation of a private bus for employees, improving cycle accessibility (through parking facilities and financial support for electric bikes), establishing carpools etc.

Plans have different names according to the institution:

- For schools: PDES, Carapatte/Caracycle (walking or cycling school buses),
- For companies: PDE, PDIE (for a group of companies located in the same area)
- For public and state administration: PDA

In the Grenoble area, the Chamber of Commerce is in charge of the PDE/PDA evaluation. Between 2004 and 2009, the travel plans, which affected 50'000 employees, have reduced private vehicle utilisation by around 4'800 trips per day. Modal share for private cars shifted from 68.3 to 58.6 %. In terms of CO<sub>2</sub> emissions, ADEME (The French Environment and Energy Management Agency) calculated that the travel plans reduced CO<sub>2</sub> emissions with 4'900 tons in 2009 compared to 2005, i.e. by about 100 kg per affected employee. This is to be compared with a total annual CO<sub>2</sub> emissions per capita of 5,5 tons (for all sectors)<sup>13</sup>.

PDIE (travel plan for a group of companies) have the advantage of reaching more employees and can thus also include smaller companies. However, it is more difficult to involve these companies actively and make the actions as efficient as in a single company.

By June 2009 (the date of the national evaluation done by ADEME) 1170 PDE existed in France, and the travel plans affected about one million employees.

## Versement Transport

The “versement transport” (VT) is a local tax that is charged to all the companies (private and public) with more than 9 employees within a delimited areas (PTU, public transport area). It was established in 1971 in the Ile-de-France region (Paris) and in 1973 outside of Ile-de-France. The aims of the tax are to reduce the public transport cost for users, to create participation from companies and to develop the public transport service.

The maximum tax contribution rate depends on the number of inhabitants in the PTU area, as described in Table 4. Certain local authorities have the possibility to increase the rate with an additional 0.05 to 0.2% (e.g. touristic areas, metropolitan areas). The local authorities that do not fulfil the conditions outlined in table 4, but have jurisdiction over a touristic area, can also charge companies with the tax.

Thus, local authorities can charge companies with the tax in order to finance the following items:

- Operational cost of the public transport network,
- Investment cost for public transport,
- Measures to improve inter-modality between bikes and public transport.

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<sup>13</sup> IEA (international energy agency) rapport “CO<sub>2</sub> emissions from fuel combustion” (2012) indicates a CO<sub>2</sub> emissions of 5.5 tons per year per capita in France in 2010.

Region	Area characteristics	Maximum contribution (% of employee salary)
Île-de-France	Paris, Hauts-de-Seine	2.60 %
	Seine-Saint-Denis, Val-de-Marne	1.70 %
	Essonne, Seine-et-Marne, Yvelines, Val-d'Oise	1.40 %
Outside Île-de-France	PTU of 10'000 – 100'000 inhabitants	0.55 %
	PTU of 50'000 – 100'000 inhabitants with new infrastructure project	0.85 %
	PTU of + 100'000 inhabitants	1.00 %
	PTU of + 100'000 inhabitants with new infrastructure project	1.75 %
	Possible extra charge for conurbations	+ 0.05 %
	Possible extra charge for touristic areas	+ 0.20 %

**Table 4: Contribution rate according to the area size in 2012**

Below follows some examples of tax rates for companies in different areas:

- In Toulouse's public transport area, the tax rate was 2% (since June 2011).
- In Chambéry's public transport area, the tax rate is 1,65% (since July 2012).
- Paris inner-city, the tax rate is 2.6% (since 2004).

According to a study from AdCF<sup>14</sup> (the French conurbation assembly), 73% of the PTU applies the maximum rate while 38 areas still can increase the tax rates.

The tax has not encountered any particular operational problems. In the 1970s, when the tax was established, there was a different economic context and the companies agreed to the tax. The tax provides certain advantages for the companies, for instance a more efficient transport system, which increases the companies' attractiveness and improves the travel conditions for their employees.

The total amount of the collected tax amounts to 3.4 b€ outside of Ile-de-France and 3.3 b€ inside of Ile-de-France. The tax covers, in average, 40% of the public transport authorities' budgets, while other subsidies<sup>15</sup> contribute with another 40% and the ticket sales finance the remaining 20%. However, the frequent increases of the taxes (for instance +0.1% in Paris in 2013), can make the tax more controversial among companies.

<sup>14</sup> « Transports collectifs : l'impossible équation financière », revue *Intercommunalités*, AdCF, n° 145, may 2010.

<sup>15</sup> Subsidies correspond to state, region, department and conurbation contribution, and come from other tax systems (income tax, property tax ...)

## Parking policies

It is difficult to measure the effect of parking policies on GHG emission reductions, but these measures are important instruments for promoting modal shifts. There is no national policy for parking in France. Each municipality has the jurisdiction over the management of their parking facilities. The most important parking instruments the local municipalities have to promote modal shift are:

- Reducing parking facilities;
- Establish time limits for parking (2-3 hours);
- Creating parking facilities in connection to public transport hubs (park and ride)

## Promotion of eco-driving

The French state wants to promote eco-driving education in companies and administrations, and these measures are included in the Climate Plan 2004-2012. The territorial collectivities must include eco-driving education in their contracts with transport operators. According to the Climate Plan, the education of one third of the population (i.e. one million drivers in France) in eco-driving would reduce CO<sub>2</sub> emission by 0.5 M ton per year.

## Restrictions on new shopping centres

The establishment of shopping centres is regulated through land use plan (PLU), which is developed by a municipality. However, the land use plan has to follow the general directives laid out in the regional development plan SCOT (the Territorial Coherence Scheme).

The SCOT is a strategic regional plan, which was first established in the year 2000. The purpose of the plan is to ensure consistency at a larger scale than the communal level in order to reduce urban sprawl and GHG-emissions. It defines general rules and objectives (for instance concerning land use) and it delimits the areas available for commercial development.

Moreover, an authorization is required for all new commercial projects bigger than 1000 m<sup>2</sup> (300 m<sup>2</sup> in communes with less than 20 000 inhabitants). The authorization can be accepted or rejected by the “departmental commercial development commission” (CDAC) based on various criteria such as localisation, complementarity with other activities, traffic impacts, reduction of pollution, energy consumption and accordance to SCOT or land use planning directives.<sup>16</sup>

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<sup>16</sup> [Decree](#) from 2009 explains application report requirement and evaluation criteria.

## 4. Research programs

Below is a list of state research agencies related to transport issues.

### **ADEME (French Environment and Energy Management Agency)**

ADEME is in charge of “investments for the future” for the state concerning the following topics:

- Renewable energy, low-carbon and green chemistry (with a budget of 1225 M€). It includes research on biofuels, hydrogen and fuel cells.
- Vehicles of the future (950 M€). It includes research development for low-carbons vehicles, sustainable energy vehicles, and rail and sea transportation. The charter described in chapter 1 about electrification comes from this investment programme. For more information see the link below:

<http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=24712>

### **LET (Transport Economics Laboratory)**

LET has a research focus on the economic aspect of transportation. Research activities are organised in three main topics:

- Land and time use by individuals or organisations
- Markets, organisations and incentives
- Modelling of passenger and freight transportation

A recurrent topic concerning GHG emission reduction is the analysis of CO<sub>2</sub> emission trading potential in transportation. Another research focus is a back-casting study on how to reach the CO<sub>2</sub> emission reduction objective for 2050.

### **PREDIT (programme of research, experimentation and innovation in land transport)**

Numerous transport issues are analysed by PREDIT. The research themes include the following topics:

- the effects of car parking policies on greenhouse gas emissions (<http://www.predit.prd.fr/predit3/documentFo.fo?cmd=visualize&inCde=38110>)
- The establishment of an eco-tax on trucks in France (<http://hal.archives-ouvertes.fr/docs/00/66/33/20/PDF/Ecotaxe-PREDIT4-janv2012.pdf>)
- The analysis of congestion charges in the Paris region and acceptability of the charge <http://www.predit.prd.fr/predit4/publication/43960>

### **IFFSTTAR (The French institute of science and technology for transport, development and networks)**

One of IFFSTTAR’s research fields concern “Mobility, Energy and Environment”. Within this topic there are research on innovation and policies to optimize mobility and its environmental impacts, for instance:

- Low-carbon vehicles: acceptability and the perspectives for distribution, new technology for electric vehicles, optimisation of hybrid technology, the analysis of battery life cycles etc.
- External effects from transport: the development of a methodology to calculate emissions from transport and to evaluate air pollution.

### **CERTU (Research agency network on Transport, Land use and Public construction)**

CERTU is a government agency publishing reference documents and establishing norms and methodologies. For instance it has produced a reference document on how to do a household survey and methods on data collection. Concerning GHG emissions, in 2011, CERTU proposed a methodology for calculating emissions from public transports (tramways, bus rapid transit).

## 5. Interesting proposals that have not (yet) resulted in government policy or action

### Kilometre tax for trucks in 2013<sup>17</sup>

Last year, the French parliament voted for a new eco-tax on freight transport. This tax will only be applied on trucks (a charge per travelled km) and charged to the freight companies owning the trucks. The system will be tested from March 2013 in Alsace and it will be applied all over France by the summer 2013.

The tax will be charged per travelled km on the national road network (excluding tolled road and communal roads). The rate per kilometre will depend on the weight of the vehicle, the number of axles and on its EURO emission classification. The charge will range between 0.025 and 0.2€ per kilometre.

The payment of the tax will be transferred directly by the freight companies to the clients. The revenues from this tax will be used to finance the development of alternative modes, such as maritime and rail transport. This tax should affect the clients' demand for freight transport and make them consider alternatives to road transport. The effects of the tax are not yet known, but the government expects alternative modes to develop as a consequence of this initiative.

### Congestion charges

Congestion charges are prohibited by law in France. According to the French law, it is compulsory to keep an alternative road free from congestion charges. However, a new decree allows experiments with congestion charges for a maximum of three years in conurbations with more than 300 000 inhabitants. Congestion charging is now discussed in France, but there are still acceptability issues with congestion charging and more information is needed before it can be implemented. Pre-studies have been carried out to analyse the effects of congestion charges on air pollution as well as on social equity.

### Low emissions zones project

In 2010, a project to establish areas where polluting vehicles are forbidden was launched in eight conurbations (ZAPA, Zone d'Action Prioritaires pour l'Air). The purpose with these areas is to reduce air pollution in order to not exceed the thresholds set by the European Union. The eight participating conurbations are Paris, Plaine Commune, Bordeaux, Lyon, Grenoble, Clermont-Ferrand, Nice and Aix-en-Provence.

In 2012, the French government published two decrees in order to regulate those areas. The regulations included a list of vehicles that are allowed to enter the low emission zone and criteria that defines the classification of vehicles. The classification of vehicles makes distinction between diesel vehicles (and hybrid diesel), vehicles using other energy sources (gasoline, E85, gasoline hybrid, natural gas) and electric vehicles. The majority of the gasoline vehicles will be authorized to enter the area whilst most diesel vehicles are prohibited to enter.

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<sup>17</sup> Source: [service-public.fr](http://service-public.fr)

Each conurbation can determine the level of restriction for each type of vehicle.

A feasibility study from Paris, with an analysis of the environmental impact of the low emission zones, is available. Even though CO<sub>2</sub> emissions are not among the criteria in the vehicle classification, this analysis indicate that the CO<sub>2</sub> emissions would be reduced within the low emission zones. The environmental evaluation indicates the following:

- CO<sub>2</sub> emissions would be reduced by 1 to 4% within the low emission zones.
- Particle emissions (PM10) would be reduced by 7 to 23% within the zones
- NO<sub>x</sub> emissions would be reduced by 10 to 27% within the zones.<sup>18</sup>

Forecasts for the low emission zones in Grenoble indicate that CO<sub>2</sub> emissions will be reduced by between 2 and 4% of within the zones.

Classification	Motorcycle	Car	Van	Trucks, bus
1*	< 31/05/2000	< 31/12/1996	< 30/09/1997	< 30/09/2001
2*	01/06/2000 - 30/06/2004	<b>Diesel</b> 01/01/1997 - 31/12/2000	<b>Diesel</b> 01/10/1997 - 31/12/2000	<b>Diesel</b> 01/10/2001 - 30/09/2006
3*	01/07/2004 - 30/06/2014	<b>Diesel</b> 01/01/2001 - 31/12/2005	<b>Diesel</b> 01/01/2001 - 31/12/2005	-
4*	-	<b>Diesel</b> 01/01/2006 - 31/12/2010 <b>Other energy</b> 01/01/1997 - 31/12/2010	<b>Diesel</b> 01/01/2006 - 31/12/2010 <b>Other energy</b> 01/10/1997 - 31/12/2010	<b>Diesel</b> 01/10/2006 - 31/09/2009 <b>Other energy</b> 01/10/2001 - 31/09/2009
5*	> 01/07/2015 + <b>electric</b>	> 01/01/2011 + <b>electric</b>	> 01/01/2011 + <b>electric</b>	> 01/10/2009 + <b>electric</b>

Source: [legifrance.gouv.fr](http://legifrance.gouv.fr)

However, all conurbations have chosen to postpone the experiment. Four obstacles to the implementation of the low emission zones were highlighted to the government:

- **Social acceptability and equity:** People with highly polluting cars often have low incomes,
- **Problems with identifying and controlling vehicles:** The only possibility to control compliance, that is allowed by legislation, is to stop vehicles and to control their registration,
- **The vehicle classification does not take into account GHG-emissions,**
- **Difficulties in having a temporary (a three year experiment) period instead of a definitive solution:** In order to obtain social acceptability, restriction must be progressive.

There will be further propositions and recommendations, with the aim of solving these issues, from the French government by the end of January 2013.

<sup>18</sup> Report about the low emissions zone experiment project in Paris, November 2012 (airparif)

## 6. Contact details of relevant government commissions/committees and of academia/think-tanks of interest

Some contact details are provided below.

### The bonus / malus system

Willy BREDA

In charge of the bonus/malus system evaluation at the Department of the Commissioner-General for Sustainable Development,

E-mail: [Willy.Breda@developpement-durable.gouv.fr](mailto:Willy.Breda@developpement-durable.gouv.fr),

Phone: +33 (0)1 40 81 97 05

### Mobility management (PDA/PDE)

Jean-Yves MARIE-ROSE

Expert on travel plans at ADEME, transport and mobility department

E-mail: [jean-yves.marie-rose@ademe.fr](mailto:jean-yves.marie-rose@ademe.fr),

Phone: +33 (0)1.49.01.45.40

### Low emissions zones (ZAPA)

Marie POUPONNEAU

Project leader for low emissions zones at ADEME

E-mail: [marie.pouponneau@ademe.fr](mailto:marie.pouponneau@ademe.fr),

Phone: +33 (0)1.47.65.20.50

### Versement transport

Yves KRATTINGER

Senator, member of the finance committee

E-mail: [y.krattinger@senat.fr](mailto:y.krattinger@senat.fr),

Phone: +33 (0)1.42.34.26.89

Stockholm, 31 January 2013

WSP Analysis & Strategy

Olivier Canella