CHAPTER 4

Policies and Measures

France's commitment in the field of policies and measures intended to attenuate climate change began at the beginning of the 1990s at the Rio Conference and the signing of the Framework Convention on Climate Change. Evolving and becoming stronger as international negotiations and expertise on the subject developed, it led to the adoption, in 2000, of the National Programme for Tackling Climate Change (PNLCC) by the Interministerial Commission on the Climate Change (CIES), a body that includes all the Ministers involved in the issue, and is chaired by the Prime Minister.

Elaborated after the Kyoto Conference to enable France to respect its 1997 commitments under the protocol, the PNLCC was designed to enable this objective to be achieved as a priority through domestic political action, that is without having recourse to flexibility mechanisms between States. This does not reflect any form of opposition to these mechanisms, upon which France reserves the right to call "in fine"; however, its decision is intended to show its preference for a real reduction in emissions on its own territory, in compliance with the principle of supplementarity .

The programme consists of around one hundred new measures and takes on previously adopted measures, often adding to them. It makes up the framework for State action against climate change over the 2000-2010 decade. When the programme was adopted, it was decided that the Interministerial Task Force on Climate Change (MIES) would organise a seminar every year to review the implementation of the programme and to announce the concrete implementation decisions on measures or additional measures to be put in place. Following the Kyoto Conference, the government also decided that, as from 1998, it would revive its energy management policy, which was one of the conditions of France's compliance with the commitments made under the Agreement. This fulfilled the need for energy resource diversification in the country, while preserving France's ability to make future energy choices. For this, the government increased the financial and human resources available to the

NOTE ON THE NUMBERING AND PRESENTATION OF MEASURES

In order to make this document easier to read and use in conjunction with the PNLCC, the reference numbers associated with the measures in the PNLCC have been listed throughout the text. The numbering system is based on that of the PNLCC, with a few additions and variations:

◗ the existing measures mentioned in the PNLCC had not been numbered. For greater ease, we have adopted a secondary numbering system that begins with 0, and generally follows the order in which the PNLCC's existing measures appear. The prefix used is that of the sector concerned (I for Industry, T for Transport, etc.);

◗ in the PNLCC, not all of the measures involving the Buildings sector were numbered. We decided to instate a systematic numbering scheme so as to maintain integrity and consistency in the way the measures are presented. These measures are listed under the prefix RT (Residential-Tertiary), along with the corresponding number, where new measures are concerned, in the paragraph where they are mentioned. For example, RT-4.4 deals with the measure covered in paragraph 3.4.4 of the Buildings chapter of the PNLCC (pp. 104-119 of the PNLCC).

Lastly, the existing measures—which are in fact nothing more than background factors or measures that have been revived in a more determined form as new measures—are listed in a special format: letters in non-bold italics, as shown in the following example:

E-0.2 Development of Cogeneration and Wind Energy

As opposed to:

E-2.2 Information and Training for the Promotion of More Efficient Appliances

This format will also be used when referring to various sections within a chapter.

Measures specifically introduced by the PNAEE are listed along with the references of the paragraph in which they are covered:

PNAEE 1) a Energy Information Stands

The charts that list all of the measures make it possible to recognise the measures that had already been presented in France's 2nd National Communication. These are also listed with a number that corresponds to the order in which they appear in this document's summary charts.

In the following sector-based reports, the measures are presented either in the order in which they are listed in the PNLCC or by subject, depending on which is more practical. The listing of the numbers in the margin is intended to make reading sufficiently easy in either case.

As a general rule, quotations of sections from the PNLCC are listed in italics.

All of the quantities of greenhouse gases have been converted into tonnes of CO_2 equivalent (tCO_2e) in order to comply with the technical recommendations issued by UNFCCC. The PNLCC listed them in tonnes of carbon equivalent (tCe). As a reminder, 1 tCe = 3.67 tCO_2e. Lastly $MtCO_2e$ means millions of tCO_2e.

ADEME (Agency for the Environment and Energy Management), in charge of the implementation of energy management and renewable energy development policy. Thanks to the consistent funding of EUR 76 million per year granted by the government and allocated to energy management and development of renewable energies in 1999, ADEME was able to launch an ambitious programme to refocus and intensify its measures in this area, in particular by giving priority to programmes to aid in decision-making. Lastly, on 6 December 2000, the government presented Parliament with the National Programme for Improving Energy Efficiency (PNAEE) which, in particular, implemented a first set of measures scheduled by the PNLCC and which again significantly increased funding for ADEME intervention in this area. In all, ADEME now has a budget for action in energy management and renewable energy development projects of more than EUR 137 million, more than ten times that of 1998.

The PNAEE also aims to secure energy independence and, in particular, to reduce the consequences for our country of the oil crises that periodically shake the world economy.

Lastly, it includes a major communications effort targeting households and small companies, which applies, specifies and completes the PNLCC's principles. In fact, since there has been no national information campaign on energy saving since the middle of the 1980s, the younger age groups in the population have never been made aware of the need to save energy.

1 Energy Production

The emissions covered in this chapter are those resulting from electricity and heat production, as well as escaping methane emissions from coal mines and leaks in natural gas grids. Refined oil and coke products are not included.

The contribution of the energy sector to greenhouse gas emissions in France is fairly low (8%). This is obviously due to the important share of energy produced through hydraulic and nuclear technology.

The general trend in emissions in the sector is rising because of the increase in electricity demand and the foreseeable decline in the share of nuclear energy in total production in 2010.

The choice as to whether nuclear power stations should be re-commissioned or decommissioned will come up massively starting in 2010. It will determine the specific levels of emissions from electricity production in later decades. The PNLCC considers it vital to give priority to actions that control demand, which are the only ones that can both be guaranteed against the effects of increased thermal energy in electricity production and preserve future choices on channels for electricity production.

The measures taken to manage electricity demand (EMD) are dealt with in this section because they will affect the electricity production sector. Of course, EMD actions relating to buildings should be studied in conjunction with the corresponding section. The relations between the various sections are explained to the greatest extent possible.

The topic of district heating systems is dealt with in the "Buildings" section (RT-0.8 and RT-4.4).

1.1 Main Existing Measures and Background

E-0.1 Nuclear Power Stations Connected Between 1990 and 2000

Listed under Number E-0.1, this is more a background item than a measure to fight against climate change, as the decisions regarding the facilities were made before these concerns arose.

E-0.2 Development of Co-Generation and Wind Energy

A target of 4 GW of co-generation was posted for the period 1995-2010. The aim of the development of wind energy, under the "Eole 2001" plan, was to install a production capacity of 250 to 500 MW between now and 2005. These objectives have been significantly increased. They have even been achieved where co-generation is concerned.

E-03 Reducing the Peaks in the Load Curve, Tempo Rate, Demand Management Measures, ADEME / EDF Agreement

E-0.4 Doubling of Incineration Capacity for Household Waste and Ordinary Industrial Waste

The change of direction in waste policy that took place in 1988 led this objective to be called into question. Today, our aim is more to limit waste production and increase the recycling of materials and organic waste, than increase incineration capacity as previously described.

E-0.5 Correction of Negative Effects of the Rate Standardisation Policy in the DOM-TOM (Overseas Departments and Territories), Corsica and Mainland Rural Areas with Sparse Population

E0.6 European Regulation on Energy Efficiency of Electrical Appliances

In line with the control of energy demand, dealt with in this chapter, two European directives, in particular, concerning energy efficiency in electrical appliances, can be cited.

Since 1992, a label indicating, for a given type of appliance, its classification on a scale of energy efficiency between A and G, must appear on appliances at their point of sale. This requirement is governed by Directive 92/75/EEC. Since 1996, Directive 96/57/EEC has restricted the sale of refrigerators and freezers with insufficient energy efficiency. These two directives were respectively integrated into French law by the Decrees of 7 July 1994 and 31 March 1998.

N.B. A more detailed presentation of the problem and the action programme for the years to come are elaborated upon in Paragraph 1.2 – "Action on Energy Demand" hereafter..

E-1.1 Agreements Negotiated with Relevant Industries on Fugitive CH_4 Emissions from Gas Networks

The replacement of pipes in grey cast iron and other pipes with PET/steel piping was furthered so as to continue improving the air tightness of the French gas distribution network. This action is also motivated by safety considerations and normal renewal of the networks, and mainly takes place as part of the normal renovation of sector structures.

By 2010, the policy of systematic replacement of porous pipes in the gas distribution networks will, for the most part, have been carried out and will make it possible to avoid 0.64 $MtCO_2$ emissions per year as compared with 1990.

N.B. This measure had already been mentioned in the 2nd National Communication; which is why it is considered an existing measure herein. However, in the PNLCC it has a new measure number, because it was to be raised in the new planning contract between the State and Gaz de France for the period 2001-2003.

1.2 Agreements Negotiated with Energy Industries

E-1.2 Agreements Negotiated (Nuclear Fuel Cycle and Losses from Electrical Power Cables)

In 1997, the nuclear fuel cycle consumed about 17 TWh of electricity (3.5% of national production). Technical solutions exist to reduce the consumption level significantly; their implementation conditions will be examined.

The Pierrelatte plant houses France's uranium enrichment capacity. In service since the beginning of the 1980s, it uses the uranium enrichment process involving gas diffusion, which consumes a great amount of electricity.

After 20 years of use, the process has become mature and the studies carried out show that only marginal improvements in electricity consumption could be achieved at this time. The plant should not become physically obsolete before it is forty, according to the best estimates. However, the emergence of competing technologies, which incidentally consume far less power, will make it necessary for its economic lifespan to be reduced.

Significant resources are currently being devoted to the study of replacement processes, which, in the long run, could reduce electricity consumption by up to a factor of 50.

Losses in the electricity grids amounted to 30.3 TWh in 2000, or 5.86% of national production. The State authorities concerned are examining measures to reduce their level in the future, in collaboration with the grid manager.

A variety of solutions contributing to a reduction in the volume of losses have already been implemented. The grid managers have opted for technical choices such as the use of higher voltage power lines, an increase in the operating voltage of an existing power line and recourse to underground cables. An agreement signed between the State and EDF gives the preference to these options.

In addition, the Law of 10 February 2000 on electricity-related utilities will give managers and users of the networks greater visibility on the economic impact of the losses. In fact the aforementioned Law stipulates that managers of public transport and distribution networks keep separate accounts that clearly show the cost of energy acquired to compensate the losses. This was not the case when network management operations were combined with those of production. The cost will have to be covered by network-use tariffs to be set by the Electricity Regulatory Commission.

1.3 Action on Electricity Demand

The specific uses of electricity concern the use of domestic or electrical office appliances, ventilation and lighting systems, and pumps and motors. The base scenario is built on the assumption that electricity consumption linked to these specific uses will grow significantly in the housing and service sectors.

The greenhouse gas emissions resulting from these uses are carbon gases (CO_2) from electricity production in thermal power plants (for emissions of fluorinated gases present in refrigeration equipment, see heading "Refrigerant Gases").

The market for the appliances concerned is mainly European. The measures designed to take advantage of potential energy savings are therefore largely reliant on improvements in the equipment-related technology available at the European level. In addition, effective national distribution of materials and equipment with good energy efficiency will be facilitated by specific actions in State buildings, carried on by actions across the country.

E-2.1 European Regulation to Improve the Efficiency of Electrical Appliances Offered for Sale

Numerous and varied appliances are manufactured for specific electricity uses and the configuration of the appliance population is constantly changing because of the emergence of new uses and technologies. Moreover, the energy cost in proportion to the overall cost can vary considerably from one appliance to another. High in the case of motors, it is low for computers.

Considerable savings can be made in electricity consumption, provided that the appropriate investments, which involve low additional costs, be made. These will rapidly be balanced out by the energy savings obtained. However, the investments are not being made spontaneously since contractors and customers do not know the cost of using these appliances.

As regards manufacturers, they do not pay for their appliances' electricity consumption and, therefore, are only concerned about the energy efficiency of their appliances to the extent that demand moves in this direction.

In the area of rational energy use, regulatory work on the energy efficiency of household electrical appliances, which started in 1992 at European level, is continuing. These regulations appear as directives, which are then integrated into French law. They have two objectives:

- raising consumer awareness of energy consumption through mandatory labelling on energy efficiency at the point of sale. Refrigerators, freezers, washing machines, dryers and lamps are currently subject to mandatory labelling. Two new directives imposing mandatory labelling on ovens and certain air conditioning appliances are being reviewed by the competent Community bodies.
- removing the least efficient appliances from the market by setting energy efficiency thresholds.

An energy efficiency threshold has been set for refrigerators and freezers (Directive No. 96.57/EC of 3 September 1996, transposed into French law by Decree No. 98-257 of 31 March 1991). A directive setting an energy efficiency threshold for fluorescent lighting ballast has also been adopted. It will be transposed into French law before the end of 2001.

France is striving to ensure that additions be made to existing European regulations on energy efficiency in household appliances. New draft directives are currently being examined.

In December 2000, during its presidency of the European Union, France succeeded in making the "development of a framework directive on energy efficiency standards, including stricter measures for reducing losses from appliances on stand-by mode" one of the priority actions of the action plan to reinforce energy efficiency in the European Community. At its request, a directive on energy efficiency in buildings was also included and is currently under review. These two projects have been introduced as priority objectives in the European Programme for the Fight Against Climate Change.

At the same time, a series of European standards will gradually have to be developed under Commission mandate. The compliance of an electrical appliance with the standard governing it would be one way to prove compliance of the appliance with regulations.

Moreover, the European Union is also pursuing the path of voluntary agreements with industrialists to improve the energy efficiency of office automation appliances. The agreement between the European Union and the USA aiming at promoting the distribution of the "Energy Star" logo is currently being finalised.

E-2.2 Information and Training for the Promotion of Efficient Appliances

Training the Professionals

Awareness and training actions will be introduced for players in the electrical appliance distribution and installation chain.

Sellers of household appliances, office automation equipment, computer equipment and lighting appliances will be informed of the institutional measures underway to improve the technological characteristics of appliances, so that they can explain to their customers the meaning of the data on the energy label and the energy efficiency labels, as well as provide information on the impact on the greenhouse effect.

The technicians in the sectors involved, and particularly installers and repairers of heating and ventilation equipment, refrigerator specialists and electricians will need to be kept informed of the risks to the global environment of greenhouse gas emissions and of the importance of the technical improvements planned for the equipment in this respect.

User Information

In order to raise public awareness of the importance of managing electricity use in the fight against the greenhouse effect, information campaigns will be carried out to explain, in particular, the role of energy labelling for electrical appliances, labels for electronic and computer equipment, as well as the need to reduce consumption of appliances on stand-by mode

In this area, it should be noted that the first phase of the "Energy Information Stands" programme was implemented in 2001, with co-financing from ADEME. Its purpose is to provide advice and expertise to individuals, small companies and local authorities.

E-2.3 Introducing Requirements Into the Thermal Regulations Relating to Equipment Connected to Specific Uses of Electricity

The energy efficiency of electrical equipment in new buildings for housing and service use is the purpose of this initiative. The areas covered include mainly the use of motors and pumps in all types of building, the lighting of all service sector premises and the common parts of collective housing.

A new heating regulation came into force on 1 June 2001 (see "Buildings" section). It already introduced the use of heating accessories (pumps, extractors) and lighting for the service sector. The reduction in electricity consumption resulting from these specific uses will be continued when the regulation is further reinforced.

E-2.4 Measures Regarding the Property of Certain Owners

For information only. This measure concerns public buildings. See "Buildings" section.

E-2.5 Electrical Work in Existing Buildings

For information only. In the present report, this measure is dealt with in the "Buildings" section.

E-2.6 Tax Measures

For information only. The issue of the energy-carbon ecotax is dealt with in paragraph 7.1 and the issue of VAT in paragraph 7.2.

1.4 Measures on Energy Production

E-3 Substituting Traditional Power Stations with Gas Combined Cycles (GCC) and Co-generation

In the base scenario, part of the electricity demand towards 2010 will be satisfied by traditional coal or heavy fuel production power stations, most of which were built before the 1980s. These units are likely to emit about 27.5 $MtCO_2e$ per year in 2010. Their total replacement by efficient units supplied by natural gas (combined cycle using GCC and co-generation would make it possible to reduce CO_2 emissions by 14.7 $MtCO_2e$ per year (estimate).

Preliminary economic assessments show that the changeover from coal and heavy fuel to natural gas could cost, in the case of fossil coal, between FRF 500 and 1500 per teC (EUR 76 to 229 per teC), that is between FRF 136 and 409 per tonne of CO_2 equivalent (EUR 21 to 62 per $teCO_2$). A tax level of 136 francs per tonne of CO_2 equivalent (EUR 21 per tonne of CO_2 equivalent) would mean that energy replacements would save 5.5 $MtCO_2e$ per year (out of technical potential of 14.7 $MtCO_2e$ per year).

For information on the plan to introduce an energy and carbon tax, see the separate section at the beginning of the chapter.

Moreover, it should be noted that current traditional power stations using coal or fuel were almost all built between 1960 and 1975. Their lifespan is about 40 years, so that most of them should be decommissioned between now and 2010; this is even more likely given the economic factors referred to above. Moreover, the imminent adoption of two EU directives, which aim respectively to restrict emissions into the atmosphere from major combustion facilities and instate national emissions thresholds, will accelerate the decommissioning process of some of the stations.

Lastly, since the end of 1997, the public authorities have adopted a specific policy in favour of the development of co-generation.

Co-generation plants can benefit from fiscal aids:

- exceptional depreciation over 12 months;
- reduction of 50% on corporation tax; this reduction could be increased to 100% by local authorities;
- exoneration from the Inland Duty on Natural Gas (TICGN) and the Inland Duty on Oil Products (TIPP) on heavy fuel with low sulphur levels.

Moreover, the conditions of payment on electricity produced by co-generation were considerably improved in March 1997; an incentive towards energy efficiency has also been implemented.

While waiting for the regulation that is to result from the implementation of the Modernisation and Development Law on Electricity-related utilities, a temporary mechanism for the period 1999-2000 has been introduced. Through it, the additional incentive towards energy efficiency was raised for the most energy-efficient plants. These measures have made it possible to speed up the development of the technology: 3.5 to 4 GW have been commissioned since 1997.

The Electricity Law of 10 February 2000 introduced a new mechanism requiring EDF or non-nationalised distributors to purchase electricity produced by plants using renewable energies or co-generation techniques. The Decree of 6 December 2000 stipulated that the mandatory purchase mechanism could benefit co-generation plants producing less than 12 MW. The Decree of 10 May 2001 established the framework for the specification of purchase conditions and the Order of 31 July specified the tariffs applicable.

These new provisions will enable the development of co-generation to continue.

It has also been suggested that the system for the exchange of emissions credits, which may be stopped for energy-intensive industries, be extended to the electricity sector.

E-4 Development of Renewable Energies

France is rich in renewable energy resources, with the largest forest area in Western Europe, the second largest wind energy stock, and high hydraulic and geothermic potential. It has been intent on making use of this potential ever since the

first oil crisis in 1973. Today it is the leading European producer of Renewable Energies (REN); mainly thanks to wood-fuel and hydro-electricity, France draws 23% of its production of primary energy and 13% of its energy consumption from its renewable sources. The provisional balance for 2000 estimates French production of renewable energies (mainland + DOM-TOM) at 27.5 MTOE.

	Electricity (GWh)	Thermal (Ktep)
Hydraulic	73,587	
Wind	94	
Sun	10	20
Geothermic	21	117
Solid urban waste	1,522	661
Wood and wood waste	1,437	8,948
Harvest residue	378	201
Biogas	346	63
Bio-fuels		335
Total	**77,394**	**10,345**
	In all	**27,527 KTOE**

However, there is still considerable potential to be exploited and determined efforts have been made, mainly since 1998, to emerge from a period of relative stagnation and to develop energies that had been little used until then.

There are three major arguments in favour of developing renewable energies: energy independence and supply safety, economic and social development and the protection of the environment. The policy of distributing renewable energies in France focuses on three goals:

- achieving sustainable results, through a supply-structuring system. The programmes set up are multi-annual with clearly defined objectives and constant resources;
- working in close conjunction with local authorities;
- using public funding as effectively as possible.

France's strategy must enable true structuring of existing production sectors, especially wood, which has particularly high potential in terms of jobs and local development. New sectors, such as wind energy, must rapidly be able to reach a high level of technological and industrial development.

The government's determination has been expressed in a number of measures and actions to encourage renewable energies (tax, regulation). Moreover, the authorities are pushing forward multi-yearly development programmes for these energies, combined with clearly defined objectives and constant resource levels, implemented by ADEME.

Tax Measures Promoting the Use of Renewable Energy Sources

Where individuals are concerned, the combination of a tax credit mechanism and a reduced VAT rate have reduced the cost of purchase of renewable energy production appliances by 15%. For companies, investment in renewable energies will benefit from exceptional depreciation over one year.

New Government Measures to Accelerate the Development of Renewable Electricity Sources

The European Draft Directive for the Development of Electricity Produced from Renewable Resources: adopted under the impetus of the French Presidency in December 2000, the European draft directive aims to increase the proportion of renewable energy sources in European electricity consumption to 22% by 2010. For France, the objective will exceed 20%, as compared to 15% at the present time.

France has also worked to ensure that the text adopted guarantee the existence of national support systems for renewable energy sources, a vital condition for their development, at least initially. The government has taken the following measures to achieve this ambitious objective:

- mobilisation of all the players involved, especially the Regions, through the Collective Energy Scheme;
- financial commitments on the repurchase price of electricity produced from renewable energies;
- reinforcement of the action mechanisms open to ADEME and the Regions.

The objective on the consumption of renewable energies will be part of the multi-annual production programme provided for in the Electricity Law, which is the reference framework for the development of medium-term electricity production plants.

Law N° 2000-108 of 10 February 2000, concerning the modernisation and development of the electricity-related utilities and the new purchase tariffs: the mandatory purchase by EDF and non-nationalised distributors of electricity produced from REN will be a leading instrument for supporting renewable energies. The power threshold below which plants can benefit from this purchase obligation was set at 12 MW by the Decree of 6 December 2000, which corresponds to the maximum threshold provided for by the legislator.

RT-4.2 Solar power for heating

RT-4.3 Geothermics

For information. The issues of geothermal and solar power are dealt with in the "Buildings" section.

E-4.1 Support for the Production of Wind Energy Electricity

The wind energy industry is expanding rapidly world-wide (it is thought that between now and the end of the next century, wind-sourced power could play a part comparable to that of hydraulic power) and its production cost, which is forecast to plunge by 2020, could make it economically profitable by that time. Increased support for this sector is fully justified as a precautionary measure focusing on post-2010; in case nuclear power production should be abandoned or reach its upper limits, wind energy would offer significant prospects for CO_2 savings in 2020, by moving away from fossil-fuel power.

Launched in 1996, the Eole 2005 programme aims to give France wind energy capacity of between 250 and 500 MW by 2005. The 55 projects selected make up total power of 361 MW. Production of wind-sourced power more than doubled in 2000. As part of the additional measures, the government has announced its objective of 5000 MW of power commissioned by 2010, more than three times that provided for initially in the base scenario. The effect of this action in reducing emissions is estimated at 1.8 $MtCO_2e$ per year in 2010, in addition to the 2.6 $MtCO_2e$ per year obtained by previous measures. Tariffs that are conducive to the purchase of electricity from wind energy were published in the Order of 8 June 2001.

E 4.2 Developing Wood Energy

So as to deal with this subject only once, this section looks at the related measures described by the PNLCC in the chapters "Agriculture", "Buildings" and "Energy production".

RT-4.1 Wood Energy

Firstly, it should be emphasised that, currently, wood is very widely used in heating in France, and is, in fact, the leading source of renewable energy today (apart from traditional hydraulic power). It was estimated to at 8.1 MTOE in 1997 (source: Energy Observatory, 1999).

The Development of Wood Energy for Collective Use and District Heating Systems

The development of the use of wood for these uses requires that:

- *investment funding programmes be continued or reinforced;*
- *commercial supply channels be implemented and developed;*
- *the reduced rate of VAT be extended to the supply of heating power using wood (including, where necessary, the connection to a heating grid) (See RT-7.2).*

Maintenance and Development of the Use of Wood Energy in Housing

The actions focusing either on heating appliances or on fuels should be noted:

- *the development of R&D with a view toward improving heating appliances;*
- *the development of information on the efficiency of appliances through the use of labels and promotion of the most efficient appliances;*
- *the development of standards and labels on wood fuel providing information on product quality;*
- *the requirement to equip all new individual housing heated by electricity with a chimney pipe, in line with the Law on Air and the Rational Use of Energy;*
- *a subsidy for the most efficient heating appliances, in the order of FRF 50 million per year (EUR 7.6 million);*
- *the availability of suitable bank products.*

Launched in 1994, the Wood Energy Local Development Plan (PBEDL) aimed to create a sustainable dynamic for wood heating in multi-tenant housing.

In order to achieve sufficient participation levels, the programme concentrated on a limited number of favourable geographical areas, regions and departments, chosen following a call for tenders. In addition to its aim to structure the offering in this area, the programme had established quantitative objectives: 225 MW in wood heating factories, saving 70,000 TOE and creating between 250 and 500 jobs.

At the end of 1999, 155 subsidies were granted for decision-making, thirty projects for structuring wood-fuel supply were carried out and 320 collective wood-powered heating units (190 in the housing-services sector and 130 in industry) were commissioned, 130 of which opened in the year 1999 alone.

Almost EUR 30.5 million of public funding, paid equally by ADEME and the local authorities concerned, were devoted to this programme.

The latter allowed for the installation of wood-burning boilers with overall power of 263 MW, consuming 70,000 TOE of wood per year, and creating 210 local jobs outside the manufacturing industry.

With the extension of the PNEDL, the 2000-2006 wood-power programme fits into the overall framework of the State-Region plan contracts. It focuses on the whole country, including the DOM-TOM, and concerns collective, as well as individual use of firewood.

ADEME and the associated regions are expected to allocate EUR 15.2 million (FRF 100 million) to the measures supporting this plan:

- an investment funding system for the purchase of wood heating units, open to industrial companies and to the housing-service sector. Experimental wood co-generation plants are encouraged for this;
- a system for promoting individual wood heating, based on the certification of heating appliances and the organisation of networks for the distribution of quality wood fuel.

The wood energy programme run by ADEME has the following objectives:

- maintaining domestic consumption of wood at 8 MTOE per year (mainly in the form of logs) and improving the energy yield and environmental efficiency of individual fuel burners by 10%;
- installing 1,000 new collective or industrial wood boilers between 2000 and 2006, thanks to structuring actions on the technology and supply market, in partnership with local authorities and professionals from the wood sector. At the end of 2000, ninety-four new collective and service sector heating units and 48 new heating units in the wood industry had been installed as part of the programme. Total investment in these 142 new heating units in 2000 amounted to EUR 62.5 million (FRF 410 million), EUR 7.3 million (FRF 47.9 million francs) of which came in the form of ADEME grants.

Overall, the total number of wood heating units commissioned since 1994 covers 1 415 plants (515 of which are for collective use and 900 for industrial heating); this represents total power of 2,403 MW (1,970 of which are used by industry).

E-4.2.1 Wood / Electricity Dual Energy

Alongside measures to manage demand and to smooth load curves, in particular using the "Tempo" tariff offer (see E-0.3), for several years, EDF has been promoting, in partnership with ADEME, the use of back-up wood heating solutions (inserts, stoves). This action, originally aimed at new housing, has been extended to housing for sale that requires renovations. It is accompanied by output requirements on the wood heating appliances, which contribute to the positive development of the market.

A booklet entitled "Electricity and Wood Heating Guide" has been published by EDF. It provides details on efficient technical solutions for wood heating and indicates the technical options available to combine electric and wood heating to optimum advantage.

In the year 2000, about 23,000 households were equipped with a wood insert. Twelve thousand new inserts should be installed in 2001.

A-2.4.1 Use of Forest Products to Provide Power

To preserve, and even encourage, wood consumption in individual housing, it is not only necessary to encourage more efficient equipment, but also better understand the cause-effect relationships behind firewood supply in rural areas and consumer demand. It is also necessary that supply be better structured.

In 2000, the wood energy plan led to an increase of 50,000 TOE of wood. ADEME is carrying out studies on the supply of that power.

PNLCC p.136 Storm Annex

The storms of December 1999 brought down large areas of French forest. The PNLCC, adopted one month later, incorporated this new factor and, to some extent, redirected the initially planned policy, especially to make maximal use of the fallen wood.

Apart from the particular emphasis placed on the carrying out of the measures already planned measures and mentioned above, it may be noted that the target regarding new wood-burning heating units was increased.

Raised from 100 to 200, the objective has been attained, as 142 new wood facilities have been fitted.

E-4.2.2. Production of Electricity from Biomass

The use of biomass for electricity production is a long-term strategy, which will significantly reduce CO_2 emissions in the future.

Biomass is generally used for heating. It can currently be put to the following electrical uses:

- biogas-operated engines (landfill sites, purifying stations, food production industries); their installed power capacity is about 50 MW and produces 0.7 TWh;
- co-generation using steam turbines:

190 MW in the DOM using cane-trash and coal and 100 MW in the paper sector;

- incineration of household waste: 90 MW.

At the request of the government, EDF launched a bid for tenders in 1999, following which five projects with total power of 13 MW will be carried out. Other projects are currently being studied.

In addition, ADEME and EDF will finance R&D projects in this area, in particular:

- *on biomass/coal co-combustion, in new LFC-type units or pulverised coal units in conjunction with herbaceous biomass (which has another positive effect – reduction in SO2 emissions);*
- *the combined cycle with prior biomass gasification .*

E5 – District Heating Systems

For information: in the PNLCC this point simply refers readers back to measure RT-4.4.

E-6 The DOM-TOM and Corsica Programme

Because most of the electricity in the DOM-TOM and in Corsica is produced by diesel generators, the development of renewable energies in these regions is of particular interest.

Consequently, the objectives set by ADEME for 2010 include the installation of 80,000 square metres of new solar panels for the production of hot water for washing, the electrification of 500 isolated sites, additional production of 600 GWh per year of electricity from renewable sources (wind: 100 MW; geothermics: 50 MW; small hydraulics: 20 MW) and the development of 10,000 TOE of wood energy per year.

Since then, the objectives set have been reinforced and expanded. The aforementioned measures will be implemented over the period 2000-2006 and 5 to 10 MW of electricity and 10 to 20 MW of thermal energy will be installed through co-generation/ biomass gasification.

2 Buildings, Housing, Services

In the buildings sector, France is continuing its vigorous policy of energy management, which has been greatly reinforced in the last few years. Its main impact is on regulations governing new buildings, but it also concerns existing buildings. It is also based on standardisation work and on information to users through the display of consumption levels. Finally, it has been decided that the use of wood in construction will be increased.

This chapter is organised by topic: the PNLCC measures therefore do not appear in their numbered order. However, particular care has been taken to ensure that all the measures are mentioned here, even when they have already been dealt with in another section.

N.B. Issues relating to fiscal measures, the ecotax on carbon-energy, and wood energy are dealt with in other sections ("Energy production" for the latter).

2.1 New Buildings

RT-0.1 Thermal Regulations (New Buildings)

RT-1.1 Reinforcement of Thermal Regulations

RT-1.4 Reinforcement of Control Means and Procedures

Since 1974, and in close collaboration with building professionals, France has initiated regulations that subject new buildings to heat insulation requirements. These regulations have been regularly reinforced and, in housing, their content has been extended towards a global approach to building that takes into account both thermal efficiency in buildings and that of heating equipment and hot water for washing.

The adoption of these regulations has reduced average consumption in new housing to half the level recorded in 1975. Today, heat savings as a result of the implementation of the thermal regulations in housing is calculated to be 15% of total heat consumption in the housing sector. Because it is not easy to reverse choices made in new buildings, due to the long life span of buildings, and because of the gradual and long-term impact of those decisions on the rate of construction of new buildings, France has decided to progressively reinforce regulatory requirements to prevent the greenhouse effect.

A new heating regulation was published in the French "Journal Officiel" on 30 November 2000 and came into force on 1 June 2001. It reflects an increase of 15% in the energy efficiency requirement on residential housing as compared to the previous 1988 regulation and of 40% for non-residential buildings. In comparison with current good practice which exceed the level of the former regulation, the actual efficiency of service sector buildings increased by 15 to 25%, while that of the housing sector improved by 5% on average.

The scope of regulation has also been extended. In addition to heating and hot water for washing, the regulations also apply to summer comfort in housing without air conditioning (requirement for compliance with a maximum agreed temperature to prevent the subsequent addition of air conditioning). For air-conditioned buildings, the regulations impose mechanisms to reduce consumption. Air conditioning consumption will be taken into account in the calculation, within two years for all buildings. The new regulation also includes lighting consumption for non-housing buildings and use of heating and ventilation accessories for all buildings.

For the first time, the regulations introduce a maximum, incompensable regulatory level for thermal energy bridges. Initially, the threshold has been placed at a level that is not too restrictive, but will be progressively lowered over the course of the opcoming regulatory stages. Thus thermal energy bridges will have to be gradually removed or treated.

Moreover, it should be emphasised that this new regulation is accompanied by a series of methods and calculation software that

integrate the latest European standards. It will thus be easily implemented by building professionals and will make it possible to easily optimise the buildings' thermal energy design. In addition, technical solutions eliminating the need for calculations will be offered to craftsmen and individuals to enable them to build everyday constructions.

As soon as the regulation was implemented, work was undertaken with the professionals concerned to follow the practical conditions of the regulation's enforcement and enable companies to learn the new rules gradually.

Lastly, it is intended that the thermal regulations will be regularly revised, every five years, based on the experience acquired and technological progress. It has been suggested that a 10% increase at each stage be the target.

The new regulations aim to remove certain equipment that is inadequate in terms of efficiency from the new construction market, such as medium- or low-range electric radiators, metal windows without heating insulation and gas boilers with pilot lights.

As they are easier to implement, the regulations should benefit from better compliance. However, inspections will have to be more rigorous, especially for individual housing and the service sector. ADEME has also agreed to finance voluntary inspection of the energy efficiency of buildings, so as to support the use of the new building regulations by the professions. Urban heating and wood heating are to be incorporated into the thermal regulations in October (decree currently being signed). Work has started to include and use solar power in the thermal regulations; it should be completed within the next six months.

2.2 Existing Buildings

The housing and service sector is made up of 27 million flats and houses, 22 million of which are principal places of residence that are constantly occupied and 720 million square metres of heated service sector premises. Most of these – 75% for accommodation and 65% in the service sector – were built before the first regulations on thermal energy in buildings came into force in 1975.

After the first oil crisis of 1973, France developed a vigorous policy for energy management in existing housing and substantial improvements were thus made. Three types of actions were launched:

- decision-making grants intended to encourage contractors to carry out energy-saving renovations;
- a policy to regulate and standardise all components;
- investment funding encompassing several types of action, including direct subsidies and tax incentives.

It has been estimated that energy-management investment in buildings built before 1975, carried out because of the measures taken, resulted in heat savings of about 10 to 20% of total heating consumption.

However, these measures must be continued and made more stringent. Work to improve existing buildings will initially benefit from the indirect effects of the heating regulation, as the regulation will encourage and develop the commercialisation of the most efficient building products and processes.

RT-0.3 Reduced rate of VAT for Work on Old Buildings

In September 1999, the government lowered the VAT rate for improvement, transformation, conversion and maintenance work on housing finished more than two years beforehand by 15 points (from 20.6% to 5.5%). The materials and work within the scope of this measure include renovations intended to control energy consumption and develop renewable energies. This measure partially replaced the system that prevailed during the previous period: income tax reductions only concerned taxed households and were impacted by a maximum reduction ceiling.

RT-0.2 Reductions in Income Tax

At the same time, to complete the system, a new tax credit was instated to benefit certain types of large equipment, which are still subject to the normal VAT rate, and are

supplied as part of renovations on existing housing. The tax credit applies to households, regardless of whether they are subject to income tax, since the credit is paid to those who cannot use it as a tax reduction.
The Finance Law for 2001 has extended this tax benefit to the cost of energy production equipment using a source of renewable energy that is to be fitted in a house which is the taxpayer's main place of residence, whatever the construction date was completed. This measure can be cumulated with the reduced VAT rate mentioned above. In autumn 2001, the benefits from this measure were extended to insulation work in buildings and heating regulation material.
An assessment of the new fiscal system (last two measures) was launched by the government in 2000, in order to measure its impact on energy-saving renovations.

RT-0.4 Exceptional Depreciation for Companies

The exceptional depreciation scheme allows companies to depreciate immediately, over a twelve-month period from the putting into service of the energy-saving equipment purchased or manufactured between 1 January 1991 and 31 December 2002 (Article 39 AB of the General Tax Code). This advantage is restricted by law to equipment mentioned in a list that takes into account technological development, especially in the field of co-generation and reversible air conditioning techniques. The list was modified by decree on 10 February 1999. The Finance Law for 2001 extended the exceptional depreciation advantage to renewable energy production equipment. This list was consequently updated through the Order of 14 June 2001.

RT-0.5 Grant for Housing Improvement

RT-0.6 ANAH Grant

A single body – the National Agency for Housing Improvement (ANAH) – handles all grants designed for private owners (grant for home improvements for owner-occupiers, and subsidies for leasing owners). Total grants for improving private housing will reach FRF 3 billion in 2001. Equipment (boilers, windows, etc.) that contributes to energy efficiency in the building are funded on the basis of their energy efficiency.

RT-0.7 PALULOS

The grant for improving rented accommodation and public housing (PALULOS) helps council lessors to improve all their housing. One hundred and twenty thousand actions are planned in the 2001 budget. Some of them will improve the energy efficiency of buildings.
The recently created legal status of private council housing lessor should also encourage energy-saving renovations in old housing.

RT-6.2 Conditions for Making Grants to the Property Business

The government has continued and reinforced its policy on encouraging energy management renovations. In line with the broader policy for improving existing housing, described in the previous points, work on energy-related aspects is now included, depending on the improvement in energy efficiency achieved, or will be subject to a minimum requirement level to receive the grant applied for.

RT-0.11 Overhaul of Public Housing

Moreover, the budget available for the demolition-reconstruction of public housing has been increased from FRF 140 million to FRF 170 million. This will make it possible to demolish more than ten thousand units per year; they will be replaced by more energy-efficient new or renovated housing.

RT-2 Voluntary Agreements

The "Construction-Environment-Timber" charter is one example (see below, "Wood used in construction"). Possibility of obtaining commitments for the withdrawal of inefficient products from the market.

RT-3.2 Action on Pilot Sector Buildings

As regards service sector buildings, the government seeks to develop voluntary

agreements for improving existing premises with organisations that ask to do so, thereby co-ordinating their action with that of the authorities, with a view to achieving quantified and scheduled objectives for saving energy. In this area, attention should be drawn on the signing in November 2000 of the "Charter on the renovation of existing premises" by the construction professions (CAPEB and FFB), financial bodies and the representatives of the major real estate owners, with ADEME and GGUHC (Department of Urban Development, Habitat and Construction, Ministry for Public Works, Transport and Housing). An agreement has been made with the National Council for Shopping Centres for joint action to improve energy efficiency in shopping centres, as part of the fight against greenhouse gas emissions.

RT-5.1 Pertaining to the Rental Sector

Certain renovations that could lead to substantial energy savings and, as a result, a reduction in heating bills, are not carried out by the owners of rented housing.

The conditions for relieving this situation are under review.

RT-5.2 Distribution of Heating Charges (Co-Ownership Properties and Collective Service Sector)

Where shared heating installations exist, occupants and lessor-owners – even if the problem brought up in the previous point is settled – have no interest in achieving savings if heating costs are shared in accordance with the rule of thousandths (that is, in proportion to the surface area of each apartment), as is most often the case. Likewise, this does not encourage the adoption of energy-saving practices. That is why, in buildings of this type, there is significant over-consumption in comparison with buildings that have individual heating systems. The current rules on the installation of meters that display actual consumption levels in each apartment will be evaluated and adapted if necessary.

RT-6.1 Programmed Operations for Thermal Improvements in Buildings (OPATB)

These operations, initiated by local authorities, will be funded up to a maximum of FRF 420 million over five years by ADEME. The objective is to co-ordinate, in a given area – neighbourhood, town, canton, department – over a period of up to several years, an operation that combines organisation and consulting, traditional action on the part of competent organisations (ANAH and ADEME) and additional grants awarded local authorities. The aim is to achieve general involvement in the renovation of the assets concerned.

ADEME funds energy analyses for service sector buildings and also plans to offer investment grants for work contributing to the energy efficiency of public or private service sector buildings, as part of the action planned to improve thermal heating in buildings.

RT-6.3 Grant System for Service Sector Buildings (FRF 100 million per year)

PNAEE IV) Studying the Implementation of a Fund based on FIDEME's Concept for Financing Renovation

A system is under review; it could take on the form of quasi-equity funding, enabling companies to receive bank loans to which they would not have had access in traditional finance conditions (see below, 1-1.4).

2.3 Standardisation of Building Materials and Equipment

RT-1.2 Technical Standardisation and Regulation of Components
RT-6.5 Support for Labelling Policy (FRF 145 million per year)
RT-8.1 Labelling and Information for the Public
RT 8.2 Environmental Quality of Products Built
RT-9 HQE Approach

Save up at the same time as the new thermal regulations, standardisation work was undertaken at AFNOR, as were life cycle analyses at the CSTB, so as to improve the technical quality of available building products. The authorities are continuing to promote the HQE (High Environmental Quality) concept. Regarding the contractual calculation methods used to determine thermal energy consumption, France emphasises that, at the efficiency levels now required, uncertainty as to the energy efficiency of products and equipment are now a decisive factor that must be taken into account. It is vital to introduce a safety coefficient into the calculations made, as is done in other areas, such as structure calculation. As there is no direct method of calculating the energy efficiency of buildings, certified products and equipment are used to calculate regulated contractual consumption. Moreover, the rules used to calculate the efficiency of insulating materials have been toughened (from a 50 / 50 fractile to a 90 / 90 fractile).

2.4 Information for Users

RT-0.10 Standardised Estimate of Energy Costs

The Law on Air and Rational Use of Energy of 30 December 1996 calls for the implementation of a requirement to supply a standardised estimate of the annual amount of energy consumption charges in housing or premises used by the service sector offered for sale or rental.

The development of a simple method of evaluation for housing, that can be used by an individual or a property agency, is proving to be delicate. Additional work must be carried out to make the calculated contractual consumption level reflect the intrinsic thermal energy quality of the housing with enough precision.

In the non-housing sector, it is impossible to define general rules: consumption analysis will be requested on a case-by-case basis for premises over a certain size. A method for small service sector premises can be based on the method used in the housing sector.

RT-1.3 Audits of Service Sector Buildings in Existence at the Time of Buying or Letting

The aim is to make an energy audit mandatory as soon as a service sector building over a certain size is put up for sale or rental.

This objective reflects the obligation, introduced by the Law on Air and Rational Use of Energy, to supply a standard estimate of annual expenditure on power.

E-2.5 Electricity Work in Existing Buildings

This measure acts as a complement that can support the system by making technical documents describing the equipment available, and making the work carried out on energy savings transparent.

When work is carried out on lighting, pumps and motors (ventilation, lifts, heating accelerators, etc.), the contractor must provide a detailed description of the facilitie carried out. Upon completion of the work, the document must remain available, with a view to future improvements, and as information for future occupants.

For the service sector, energy analysis must be supplied for any sale or rental transaction. It must contain the specific electricity consumption listed above.

2.5 State Buildings

E-2.4 Action on the Assets of Certain Building Owners

In reality, although it is not clear from the title, this measure concerns government buildings, apart from a preliminary reminder of other measures for other owners.

In government buildings, organisational measures in the departments and measures to raise the awareness of managers will encourage the promotion of energy-saving equipment, the optimisation of facilities management and of work scheduling in public purchases. The equipment concerned will be pumps and motors, lighting (fluocompact bulbs, ballast with high energy yield) and equipment for office automation. These measures will be complemented by awareness initiatives targeting all government workers. There is high potential for reducing consumption provided that energy-saving practices are adopted.

It should be noted that the Action Plan for Energy Efficiency and the European Programme for the Fight Against Climate Change include a draft directive on public purchases, which aims to enable the definition of criteria for the choice of efficient products and the issuing of technological calls for tender, intended to encourage the development of new products.

RT-0.9 Projects Involving Government Buildings
RT-3.1 Project on Government Buildings

The various measures taken up to now have shown a certain number of limitations that must now be overcome to reduce emissions from government buildings and to motivate other owners, who also manage significant amounts of property, to adopt similar methods.

Therefore:

- *measures will be taken to organise departments in such a way that concerns over energy efficiency are taken into account; these organisational measures will be complemented by awareness-raising projects aimed at all workers;*
- *technical measures with mandatory periodic audits of energy supply contracts and energy and fluid consumption. (…) Economical equipment and energy will also promoted for public purchase.*
- *measures relating to funding will be implemented (…).*

These three types of measures require the development of a common work method and co-ordination of the efforts and potential of the various ministries. Three of them have a special role to play: the State Secretariat for Industry (MEFI), which is the natural counterpart on energy policy and heads a group of top civil servants responsible for energy; the Ministry of Land Planning and the Environment, responsible for "green development"; and the Ministry of Public Works, which has responsibility for construction and public building and a high-profile presence across the country, which makes it an effective go-between with the local authorities.

MIES will give the Prime Minister a proposal for organising the various departments involved and an operating programme for government departments.

Incentives will be granted to reward highly effective undertakings, in the form of funding for decision-making studies and for the carrying out of a number of exemplary operations.

To provide an example, the Minister for Public Works, Transport and Housing has decided, in conjunction with the Ministry for Economy, Finance and Industry, to improve its property management. Energy savings were selected as the priority topic. The property is managed in a highly decentralised way. An Action Plan will be implemented at the end of 2001 to reinforce understanding of energy consumption in these buildings. As part of this, a list of the various levers that need to be put in place to achieve effective results (methodological and technical support, funding) will be drawn up. In addition to having a direct impact on the property for which it is responsible, the programme is expected to serve as motivation for other managers of public buildings.

2.6 The Development and Use of Wood in Construction

RT-2 Voluntary Agreement on Wood in Building
A-0.1 Timber in Construction
A-2.4.2 Timber in Construction

The Air and Rational Use of Energy Law of 30 December 1996 calls for a decree stipulating the conditions under which certain new structures will have to be built with a minimum amount of timber.

Of the 14.7 million cubic metres consumed annually in France in the form of sawn wood and panels, it is thought that about 12 million cubic metres are used for long-lasting uses (furniture and buildings); this represents a tangible long-term asset of 7.3 $MtCO_2e$ per year, of which about 80% is in building and 20% in furnishings. As a prospective analysis of French consumption of wood showed that there were prospects for significant development in construction, a project in this field is in progress; it includes the following four components:

- development of operations to promote timber in construction. This task has been entrusted to the National Committee for Timber Development (CNDB);
- removal of the factors blocking more widespread use of timber in building through research, development and "ad hoc" popularisation by the Technical Centre for Timber and Furnishings (CTBA);
- development of a strategy for the offering of industrial products or semi-products, using the strength of the sawn wood sector;
- establishment of a permanent monitoring tool that provides reliable information based on market observation and development of the use of timber in building (list of timber products, observatory of building companies that use timber).

Together, the four components gave rise to the "Construction-Environment-Timber Charter", which was signed by the professionals involved and by the government. The charter mobilises all of the forces available. Its objective is to increase the amount of timber used in construction by 25% by 2010. This measure will have three effects on greenhouse gas emissions:

- building with timber uses far less energy than other building methods;
- it enables the storage of carbon over a long period in the form of wood-material;
- it creates new outlets and encourages improved use of the French forest.

The new Forests Law also includes measures to make the "forest-timber" sector more dynamic, thereby having a positive effect on the development of the climate.

In particular, it has been recommended that the gathering of timber for construction be increased by 6 million cubic metres per year; it is therefore necessary to strongly develop the uses of wood and its transformation.

2.7 Other Measures

RT-0.8 Classification of District Heating Systems – Mandatory Connection
RT-4 – Renewable Energies
RT-4.1 Wood Energy

For information. Measures dealt with in "Energy production".

RT-4.2 Solar Power for Heating

Promotion of Solar-Powered Water Heaters in the Overseas Departments

Solar-powered water heaters would be very competitive in comparison with electrical water heaters in the Overseas Departments (DOM), if electricity were sold there at the local retail price and not at the same price as in mainland France, due to principle of standardisation.

To correct the effects of tariff standardisation, ADEME, EDF and the local authorities have joined forces to subsidise solar hot water as part of the "20,000 solar water heaters" operation: thanks to this, users pay 30% less for their hot water, the sector's industries have seen

their business develop, EDF is reducing its losses on sales, and CO_2 emissions and atmospheric pollutant levels are falling. Launched in 1996, the aim of the operation was to install 20,000 solar water heaters in five years, a saving of 10,000 TOE per year, the creation of a hundred local jobs and a one-third drop in the price of water heaters.

As early as the end of 1999, a total of 20,300 water heaters had been distributed under this programme, exceeding the targeted objective. The year 2000 confirmed the success of this operation with the sale of 9,628 appliances, thanks to skyrocketing sales in La Réunion (6,455 solar water heater sales in the year 2000 alone). To date, almost 30,000 water heaters have been sold in the DOM.

Thermal Solar Energy in Mainland France

At the request of the authorities, ADEME brought the Hélios 2006 programme into its operational phase. Its purpose was to distribute solar water heaters and solar water heater systems known as "direct solar platform" in mainland France.

The programme, launched by ADEME in partnership with five southern regions, is expected to gradually extend to all the regions in mainland France.

The Hélios 2006 programme, which was designed as a large-scale version of the action carried out in the DOM, calls for the market to be structured thanks to the implementation of two systems:

- labelling of the equipment eligible for ADEME grants;
- the creation of a "Qualisol" charter, which installers eligible for Hélios 2006 will have to follow.

Counting on the economies of scale that Hélios 2006 is expected to bring about, it has been decided that the equipment grants (presently between EUR 686 and EUR 1143 for an individual solar Hélios 2006 water heater, depending on the size) will be reviewed periodically. The aim of the programme is to install 15,000 solar-powered water heaters and 500 direct solar platforms per year by 2006.

The ADEME intervention budget for the programme is EUR 6.1 million per year.

As of 31 December 2001, six months after the launch of the campaign to promote the "Sun Plan" under Hélios 2006, 185 pre-diagnostic and pre-feasibility studies have been carried out on potential owners. For a budget of EUR 229 000, six hundred and ninety individual solar-powered water heaters (3,000 square meters of sensors have been installed and 110 installations of direct solar platforms have been financed with an ADEME grant of EUR 158,000. Also, 435 installers have signed the Qualisol Charter.

RT-4.3 Geothermal Energy

There are two sorts of geothermal energy in France:

- low-temperature geothermal energy that is used for supplying heat to grids: this field has experienced new growth since 1999, thanks to the extension, in the year 2000, of the long-term guarantee given to geothermal contractors in the Ile-de-France region;
  - extension of the life span of the long-term fund, thanks to additional funding supplied at par by ADEME and the owners;
  - revamping of the operating principles of the long-term fund.

Alongside this fundamental action, for which it has already mobilised EUR 2.3 million in 1999 and 2000, ADEME also launched a series of programmes to support the extension of district heating systems. The ultimate objective is to connect 30,000 additional unit equivalents in Ile-de-France to grids supplied with geothermal power.

- High-temperature geothermal energy, which can also produce electricity – today France has only one production facility, in Bouillante (Guadeloupe). Given the high quality of this site, there are plans to expand the unit to up to 10 MW, on the basis of the results obtained from the drilling campaign and production tests. In addition, prospective studies have been launched on comparable sites in Martinique and Réunion Island.

R&D is also being carried out in this field, on hot dry rocks on the Soultz-sous-Forêt site in Alsace. This is a European programme, which entered its "scientific pilot" phase in 2001, under the leader-ship of an industrial contractor with a GEIE status [Economic Interest Group]. The "pre-industrial" pilot phase with electricity production is planned for 2004.

RT-4.4 District Heating Systems

District heating systems are valuable vectors for exploiting renewable or final energies such as geothermal power, wood energy or waste incineration. As regards competition, they are at a disadvantage due to the application of the reduced-rate VAT on gas or electricity, which is not granted to them. However, the authorities want to develop the use of heat networks based on renewable energies. They are trying to increase the role of renewable energies in supplying existing networks, to promote their expansion while encouraging the reduction of unit consumption of connected housing, and to foster the development of new grids. To this end, the Decree of 5 may 1999 encourages the classification of district heating systems that use mainly inevitable or renewable energies. The classification makes it mandatory for certain buildings to be connected to the grid.

RT-6 Incentive Measures

RT-6.4 Grants for Condensation Boilers for Shared Use

RT-7 Tax Measures

RT-7.1 Environment Tax

RT-7.2 Reduced rate of VAT for the Sale of RES Heat

Services for heat delivery are subject to the normal VAT rate (20.6%), in compliance with Community directives. The application of the reduced rate to these services, preferably restricted to deliveries of heat from renewable resources (wood, geothermal energy, waste incineration), would be likely to encourage the promotion of these methods of production, which produce lower carbon emissions. The reduced rate should be applicable to both the fixed rate (access to services) and the charges calculated according to the amount of power supplied.

RT-7.3 Reduced rate of VAT: Energy-Saving Products and Services

For information. See the section dealing with this issue below (7.2).

3 Transport

Controlling the growth of emissions in the transport sector is the PNLCC's greatest challenge. Already responsible for 22% of total emissions of greenhouse gases in 1990, and 26% in 1999, this sector would account for 27% of emissions in the base scenario in 2010 if no new measures were taken. Moreover, the base scenario already took into account reductions in unit emissions from vehicles, resulting from the agreement between the European Commission and car manufacturers. The impact of the new measures planned by the PNLCC in the transport sector accounts for a quarter of the overall effort of the programme, that is, 9% of the emissions planned for 2010 in this sector. The following-up of these measures will therefore be very important for the success of the PNLCC. With the interministerial development of schemes for public transport services, concerns about the fight against climate change have been totally integrated into transport policy. The directions taken in these service schemes aim to stabilise CO_2 emissions from transport at a level

of about 141 $MtCO_2e$ in 2010 (multi-modal aggressive scenario). The major lines of France's action in this area are:

- technological improvements in vehicles and reduction in unit emissions;
- goods transport policy, especially the development of rail freight;
- policy on inter-city passenger trips;
- policy on city travel;
- transport pricing and taxation;
- relations with users;
- other operations, especially rail and air.

These axes have resulted in very important changes in funding distribution in the Ministry of Transport, resolutely in favour of the least polluting methods. Since 2000, results have been quite obvious in the changes in the distribution of the various methods of transport. Detailed monitoring of the measures planned by the PNLCC can only be carried out on each of the main focal points, at this stage. That is why we will first of all review all the PNLCC measures for each of these main groups and then we will provide the measures taken or planned. We will only rarely give details of the special suggestions for each measure.

3.1 The Role of the Various Partners in the Organisation of Transport in France

The organisation of transport in France is defined in the Law on the Organisation of Internal Transport (LOTI), approved in 1982 and revised several times since then.

The State's major objectives are set out in public transport service schemes, in compliance with the Law on Urban and Regional Planning and Development (LOADT). Corresponding investment projects are generally carried out within the framework of plan contracts (Contrats de plan) over several years between the State and the Regions.

Road Transport

The State is responsible for the national road network. Toll motorways are granted to operators that build, maintain and operate their networks. Other roads in the national network are built and repaired by the State and regional councils as part of the plan contracts between the State and the various Regions. They are maintained and operated by the State. The other roads (within the departments and towns) are enitrely managed by the relevant local authorities.

Rail Transport

The rail network is built and maintained by the French Rail Network (RFF).

The National Rail Company (SNCF) is responsible for operating trains.

Regional Passenger Transport Network

The organisation of regional transport networks is gradually becoming the responsibility of the Regions, as defined in contracts with the SNCF. Public road transport and school run buses are the responsibility of the Departments.

Urban Passenger Transport Network

In major conurbations, the organisation of transport within cities is the responsibility of an urban transport organisation authority for all transport within an urban transport perimeter. In conurbations of more than 100,000 inhabitants, this authority is responsible for developing a plan of urban travel, defining the main travel policy trends. The authority is also in charge of managing public transport within the scope of urban transport. Other actions, in particular regarding roads and traffic, are the responsibility of the various local authorities involved. These measures have to be compatible with the urban transport plan. Conurbations of less than 100,000 inhabitants can develop a UTP (Urban Travel Plan) on a voluntary basis.

3.2 Technical Improvements for Vehicles and Reduction in Unit Emissions

T-0.3.3 Promotion of Electricity-Powered Vehicles and Other Alternative Vehicles
T-1.4 Electrical and Alternative Vehicles

Ambitious measures have been taken to encourage the penetration of alternative vehicles (see insert below).

T-0.1.7 Research Efforts on Vehicles and Transport Organisation
T-0.3.1 Reduction in the Consumption Levels of New Vehicles
T-0.3.2 Technical Inspection of Vehicles
T.1.1.1. Monitoring of Agreements and Future Reinforcements
T-1.1.2 Extension to Lightweight Commercial Vehicles
T-1.1.3 Incentive to Replace Vehicles
T-1.1.4 Other Incentives (Vehicle Labelling, Tax Credits)
T-1.2 Alternatives to Air Conditioning
T.1.3 Controlling HFC Leakage
T-1.6 N_2O Emissions – Catalytic Converters

Technological improvements of vehicles are the responsibility of car manufacturers. However, the French government intervenes at several levels: by monitoring the implementation of the voluntary agreement between the European Commission and car manufacturers, through information to consumers, through technical inspection regulation and through the running of research programmes. A voluntary programme had been signed with French car manufacturers to reduce unit emissions from new

TAX MEASURES

1 - Exceptional Depreciation
Article 39 AC of the General Tax Law allows buyers of alternative vehicles (operating on electricity, natural gas, or liquid petroleum gas fuel) or new electric motorcycles to benefit from an exceptional depreciation, until 1 January 2003, over a period of 12 months. This measure also applies to accumulators, equipment specifically designed to enable the use of electricity, natural gas or liquid petroleum gas, material specifically intended for the storage, compression and distribution of natural gas and liquid petroleum gas, and to charging equipment for electric vehicles, the latter being provided for by Article 39 AE of the CGI.

2 - Reduction of the TIPP and TICGN
As of 11 January 1999, domestic taxes on natural gas and on the special mixture of butane and propane intended for use as fuel, were reduced to Community-wide minimal levels: EUR 10.02 per 100 kilograms (FRF 65.7) on liquid petroleum gas and EUR 8.38 (FRF 54.97) on natural gas for vehicles.

3 - Possible Exoneration from Differential Tax on Vehicles
Article 1599 Fb of the General Tax Law now allows the Conseil Général to fully or partially (up to 50%) exonerate from differential tax all vehicles that operate, whether exclusively or not, on electricity, natural gas or liquid petroleum gas.

4 - Possible Exoneration from Proportional Tax on Registration Certificates of Alternative Vehicles
Likewise, Article 1599 novodecies A (General Tax Law) allows the Conseil Régional to fully or partially (up to 50%) exonerate the aforementioned vehicles from proportional tax.

5 - Exoneration from VAT for Alternative Fuels
Article 298 of the General Tax Law allows users who cannot take deductions on VAT (meaning all users except drivers of buses, taxis and company-owned utility vehicles) to recover 100% of VAT paid on fuels made of natural gas or liquid petroleum gas. Article 273 septies B of the general tax law allows for an exoneration from VAT on electricity consumed for all cars operating only on electricity.

6 - Exoneration from Tax on Company-Owned Vehicles
Article 1010 A of the General Tax Law now provides for total tax exoneration on company-owned vehicles that operate on electricity and natural gas. The exoneration amounts to one-fourth of the total amount when the vehicle operates alternately on superfuel and liquid petroleum gas.

7 - Reimbursement of Domestic Tax on LPG and NGV Consumption
Article 265 sexies of the Customs Law allows operators of public transport networks, garbage trucks and taxis to obtain reimbursement of the TICGN on NGV and of the TIPP on LPG, for up to 40,000 litres per vehicle per year (public transport network) or up to 9,000 litres per vehicle per year (taxis, garbage trucks).

8 - Tax Credit for Vehicles Operating on LPG or Hybrid Systems
Article 200 quinquies of the General Tax Law states that taxpayers who fiscally reside in France can enjoy a tax credit of EUR 1 524 (FRF 10,000) for expenses incurred between 1 January 2001 and 31 December 2002 related to the purchase, first-time lease, or rental for less then two years of a new vehicle that operates exclusively or partially on liquid petroleum gas fuels, or combines electric power and a gas or gasoil engine.

vehicles. This agreement has been replaced by the agreement between the European Commission and all car manufacturers established in the European Union (agreement with ACEA covering 140 grams of 2008, and with Jama and Kama covering 140 grams of CO_2 per kilometre in 2009).

As part of the follow-up to the European agreement, UTAC has been given responsibility for centralising information on new vehicles sold in France. At the same time, as part of the "Nation's Transport Accounts", the government has implemented particularly intensive monitoring of the effective consumption of vehicles circulating in France. It is necessary, in particular, to check whether the unit consumption of French vehicles remains 6% lower than the European average, despite the removal of the car tax disc (annual tax on vehicles in force until the year 2000), and to check whether consumption by the number of cars in circulation is following a development pattern similar to that of new vehicles, as has been the case until now.

The initiative to make technical inspections more rigorous is currently fully operational. The regulations require an inspection on all vehicles over four years old. State-approved inspection networks carry out the inspections. Repairs are mandatory if there are anomalies in pollutant emissions; otherwise the car can no longer stay on the road.

In addition, under PREDIT II, a research programme that brings together the government and car manufacturers, considerable efforts have been devoted to vehicle energy consumption. Studies and research relating to energy account for 27% of public finance (excluding ANVAR), EUR 48.78 million (FRF 320 million) excluding tax, out of EUR 175.32 million (FRF 1150 million). Almost 95% have been allocated to technological improvements. The most significant research has been into improvements in traditional vehicles (internal combustion engines) and new vehicles (hybrid, fuel cell battery, batteries). The fight against climate change is now the priority challenge for the new PREDIT, launched in June 2001.

Contact has been made with French car manufacturers to measure real emissions of N_2O) in recent vehicles, because they may have been incorrectly assessed. France is envisaging applying to the European Commission to integrate N_2O into emission standards.

Emissions resulting from the use of air conditioning have been measured as part of the PREDIT programme. Their analysis is expected to lead to the launch of another action programme.

Discussions have been undertaken at European Union level to foster a change in user habits, so that they buy cars that consume less. Because the market has opened up and users can buy their vehicle anywhere in the EU, it has become essential to harmonise measures.

France has proposed technical specifications to Geneva on an adjustable speed regulator (ASLD), which would enable drivers to remain below their chosen speed. The document received the approval of the technical group of experts and must now be adopted by the EEC-UN WP29, with the prior agreement of the Member States of the European Union. France has set about convincing its European partners of the value of the system, in terms of both road safety and energy savings and will continue its action to improve speed control conditions by the driver or by the vehicle manufacturer.

3.3 Policy on Transport of Goods

T-0.2.2 Development of Intermodal Transport of Goods
T-3.1.4 Combined Transport and Grouping of Shippers
T-2.4 Facilitating Marine Navigation
T-4.1 Organisation of Community Space
T-4.2 Other Aspects of Interurban Infrastructure Supply
T-4.3 Intermodal Facilities for Combined Transport

Inter-city transport of goods accounts for about one quarter of the emissions from the transport sector. If no action is taken, it is thought that the amount of goods transported by road will nearly double between 1996 and 2020, from 214 to 396 billion kilometre-tonnes (km-t). This rise is due in large part to the increase in international traffic and long-distance traffic. That is why the promotion of efficient alternatives to road transport and the long-term preservation of resources and environmental quality are two of the major focuses for public service goods-transport schemes, the implementation of which is to a large extent dependent on concerted action at European Union level. The main actions proposed are:

- organisation of freight rail services on a European scale, that take into account:
  - the economic, social and environmental costs of the various methods;
  - the need to harmonise technical functions and conditions of access of operators to the network;
- development of a national and international rail transport offer, acting as competition to roads, in particular as regards:
  - routes that fulfil client needs (speed and times);
  - improvements in productivity and quality of service in freight transport by rail, without which it could not develop in the long term;
  - capacity increases in rail infrastructure in a certain number of bottlenecks, taking into account the concentration of traffic and its prospects for growth;
- development of potential for sea transport, in particular making reception and development of sea navigation easier;
- full use of the potential of river transport on itineraries where the demand for freight transport remains high, especially those involving large vehicles.

Within this framework, a number of concrete measures have already been implemented;

- the SNCF has started to purchase equipment specially for freight;
- new routes have been cleared for freight, in particular in line with the freight corridors in trans-European networks;
- actions to support the development of combined transport have been continued and reinforced, in line with the PNAEE;
- during France's presidency of the European Union, an agreement was reached on the methods of implementation of the rail package.

The Ministry of Transport is currently developing a plan for complementary measures with a precise schedule, aimed at achieving the objective of doubling rail freight between now and 2010.
The decision was made to experimentally implement a "rail expressway" between Lyons and Turin as early as 2002, with a complete service from 2005-2006.
Actions for developing sea and river transport have also been pursued.
Already, river traffic has increased by 26% since 1997.
Lastly, these priorities are reflected in the way the Ministry of Transport's budgetary allocations have changed (see below).

3.4 Policy of Intercity Passenger Travel

T-0.3.5 Regional Express Travel
T-0.3.6 Development of the TGV Network
T-2.3.1 Management of the Main Inter-city Routes
T-2.3.5 Passenger Information

The rapid development of light vehicle inter-city road traffic has led to an average increase of 4.6% per year on the national route network over the last twenty years. Similarly, air traffic is experiencing strong growth, of more than 10% between 1970 and 1980, 5% between 1980 and 1995, and between 6% and 7% since then. International traffic has risen much more rapidly than internal traffic. That is why the passenger transport service scheme calls for the following measures:

- technical regulation of noise and polluting emissions in vehicles and planes: standards for new vehicles, technical inspections of vehicles in circulation, research on clean vehicles and noise reduction, and certification of aircraft;
- design of new infrastructures and renovation of existing infrastructures, taking into account protection against noise, avoiding sensitive natural environments, limiting breaks with the environment and better incorporation in the landscape;
- promotion of methods of transport that save energy and are low in pollutants, especially rail; this implies the implementation of a transport offer that can compete with the road and which is attractive in terms of quality (times, reliability) and price.

This last aspect has led to reinforced action, since 1988, on the development of rail services for passengers. The investments into new TGV routes (TGV-Est in 2006) were carried on. They allowed for the opening of TGV Méditerrannée in June 2001. Also of note is the increasing success of Thalys (Paris-Brussels) and Eurostar (Paris-London). SNCF is improving the attractiveness of its services – a more dynamic commercial and pricing policy, new services (like the night TGVs that are gradually being introduced).

Decentralisation to the Regions of the organisation of regional transport for passengers has continued. It should lead to a greater balance between the regional express train offering (TER) and customer demand, in particular on home-work commutes. The framework for the decentralisation was set by the SRU Law and should be fully implemented by 1 January 2002.

Action has been taken to manage the main intercity routes, so as to reduce congestion, for many years (the "Bison Futé" operation). They are regularly improved and reinforced, notably following approval of the development plan on the operation of the route and the more recent development plan for road and traffic news.

3.5 Policy on Urban Transport

T-0.1.5 Tolls in Urban Environments
T-0.1.6 Air and UTP Law (Urban Travel Plans)
T-0.3.4 Urban Travel
T-2.3.2 Regulation of Lights and the Progressive Signal System
T-2.3.3 Priority for Public Transport
T-2.2.4 Regulating Urban Fast Lanes
T-3.1.1 Controlling Urban Development
T-3.1.2 Documents on the Urban Environment and in Cities and Localisation of Activities
T-4.4 Public Transport and Alternative Transport Modes
T-3.1.3 Impact of the Waste Management Scheme
T-5.3 Corporate Responsibilities

The development plans on services have insisted on priority being given to the development of urban public transport. This development is based, in particular, on the implementation of Urban Travel Plans (UTP). Revived by the Air Law of December 1996, these encourage:

- a reduction in the use of cars in towns;
- development of public transport and other means of travel, such as cycling and walking, and an improvement in points of exchange between these methods;
- sharing of routes by the various methods of transport.

Taking into account the possible developments in the other sectors (energy production, industry, building), the development plans show that the targets on reducing greenhouse gas emissions also imply a change in urban organisation methods, so as to give users equal satisfaction, all the while limiting the distances covered by car.

Concrete measures have already been introduced:

- a first generation of Urban Travel Plans is being developed by the local authorities. By mid-June 2001, about 40 Urban Travel Plans had been approved, or more than half of those required;
- a methodological guide on the environmental assessment of Urban Travel Plans ("UTPs – Taking into Account Air Pollution, Noise and Energy Consumption") was published in November 1999. It includes the impact on greenhouse gas emissions;
- the first review of the implementation process was carried out at the end of 2000. It precisely analyses the directions taken in a certain number of Urban Travel Plans. It shows a gradual improvement in recognition of environmental concerns. CERTU and GART (Grouping of authorities responsible for transport) have launched a review of a simplified method that would allow environmental concerns to be integrated into existing Urban Travel Plans without gathering additional information.

In addition, it appeared necessary to reinforce the objectives of the Urban Travel Plans. The Law of 13 December 2000 on solidarity and urban renewal (SRU) set the new Urban Transport Scheme objectives, in particular as regards parking, and gives the organising authorities a role in running all the transport in the conurbation. In particular, they will have to foster the elaboration of mobility schemes by companies. The law also instates mandatory compatibility between town planning and travel schemes.

Today the priorities are:

- completion of the Urban Travel Plans that have not yet been approved;
- implementation of the approved Urban Travel Plans;
- integration of the new measures of the Solidarity and Urban Renewal Law in particular concerning travel safety, parking and goods transport in towns.

ADEME is financing preliminary studies for the development of Urban Travel Plans (they themselves being eligible for grants from the Ministry of Transport).

The setting of State subsidies for measures taken by the Urban Travel Plans will encourage their implementation: EUR 76.22 million per year (or FRF 500 million) have been set aside to support local authorities in addition to ADEME funding. They will be managed by the Decentralised State Services (DDE), in conjunction with ADEME's regional delegations. Action in favour of public transport has also been reinforced with FRF 76.22 million per year for the numerous tramway projects. Moreover, some local authorities are considering the development of tram-train projects (vehicles that can circulate both on SNCF lines and on tramways).

The implementation of Urban Transport Scheme observatories and of monitoring indicators in conjunction with CERTU, should make it possible to quantify these efforts. It will be particularly useful to be able to make precise evaluations of the impact of Urban Travel Scheme measures on the evolution of greenhouse gases.

An interministerial mission was set up in 1998 to promote the use of bicycles. Numerous authorities organising inner city transport developed combined cycling/public transport actions (Strasbourg, Paris etc.). In addition, the Minister for Public Works has decided to set up funding for the developing of networks to structure bicycle lanes.

3.6 Pricing and Fiscal Aspects of Transport

T-0.1.1 Catching up on Diesel Taxation
T-0.1.4 Changes in Fiscal Policy on Vehicles
T-3.2.1 Tax on Kerosene Oil
T-3.2.3 Tax Differential between Fuels
T-3.2.4 Fiscal Treatment of Fuel Used by Public Transport
T-3.3.1 Internalising the Costs of Carbon
T-3.3.2 Pricing of Urban Travel

In September 2000, the very significant rise in the price of oil resulted in decisions intended to limit its social and economic impact: the implementation of a "floating" TIPP (Inland Duty on Oil Products) and the suspension of the annual increase of 7 centimes (1.07 cent) in tax on diesel oil as opposed to petrol. At the end of 2002, it was decided that the catching-up process would be suspended until 2002 and the energy-carbon ecotax project was suspended until further notice (see paragraph 7.1).

However, it should be noted that the increase in the price of oil meant that users had to pay much higher prices than those that would have resulted from the originally planned tax increase for fuel or road transport of goods. The increase in the price of fuels, in a sense, occurred without it being necessary to intervene. The effect on fuel consumption is obvious, as was seen in the stagnation in road traffic in 2000, for the first time since the first oil crisis. Recent decisions do not call into question the direction set out in the PNLCC, especially the ultimate objective of reducing the IPOP (TIPP) differential between petrol and diesel and the internalisation of the cost of carbon, as part of the fight against the greenhouse effect, in the fiscal measures on fuel, all the while taking into account the European competition context.

In the absence of a European decision regarding the taxation of energy and an increase in excise, France has had to take account of unfair competition between French and foreign road haulage companies. This illustrates the need for Europe to progress in this respect. Moreover, at least as regards commercial transport, tariff policy is only one of the factors in transport prices; personnel costs also play a significant role in the development of prices. The situation is now such that there is a real risk of road transport being "delocalised" (transport carried out in France by foreign companies). Despite recent advances in the working hours of drivers of road vehicles, additional efforts have to be made to harmonise and manage labour regulations. Lastly, it is necessary that haulage companies be in a position to reflect rises in costs in their prices. This requires that contracts be adapted, something requiring co-ordinated action at the European level. It is vital for the work to be carried out following the publication of the White Paper by the European Transport Commission take into account the objectives relating to the fight against the greenhouse effect. Tighter rules on access to the profession and professional training should enable company directors and main parties responsible to respond more effectively to the challenges of European competition and to absorb the hazards of the economic climate, which are inherent to the market.

It would also be useful to assess the possible impact of the removal of the tax disc, which occurred in 2000, and which was one of the PLNCC's existing measures.

As regards kerosene taxation, France participated very actively in the work carried out by the European Union and the International Civil Aviation Organisation (ICAO). It put forward its preference for a worldwide fuel tax. It took cognisance of the various studies comparing possible solutions (tax on kerosene, adjustable duty depending on the environmental features of planes, voluntary agreements and tradable permits). It will support the adoption of strong measures by the ICAO and the implementation of complementary or alternative measures within the European Union.

3.7 Relations with Users

Road Professionals

T-0.2.1 Regulating and Controlling Working Hours

T-2.1.1 Monitoring of Speed on Heavy-Goods Vehicles

T-2.1.2 Technical Control of Heavy-Goods Vehicles at Roadside

T-2.1.3 Limiting the Speed of Light-weight Utility Vehicles

T-3.2.2 Compliance with Work Rules in Road Transport Professions

T-5.1 Training Professional Drivers

The efforts launched to improve working conditions in road transport have continued. Following the tightening of requirements for entry into the profession, the promotion of the electronic tachograph and the increase of penalties against those who do not respect rules on driving time and rest time, new actions were launched within the framework of the "Progress Contract" and the implementation of the reduction in working time, which had made it necessary to reinforce labour laws on road transport. They were accompanied by measures to reinforce inspections on the respect of the regulations and the corresponding administrative means.

Nonetheless, the progress expected on social harmonisation at the European level has been far from sufficient and does not yet guarantee fair competition between carriers in the various European states. In this area too, France intends to make the issue a priority in the implementation of the European Commission's White Paper on Common Transport Policy.

Private Drivers

T-0.3.8 Controlling Speed of Light-weight Vehicles

T-1.7 Speed Limits on Lightweight Vehicles

T-5.2 Instruction for the Driving License

Improvements in driver training as a whole have been undertaken, with a first drafting of the new knowledge test for driving license applicants, improvements in professional training for driving school teachers and inspectors. In addition, actions to limit speed were reinforced following the October 2000 meeting of the Interministerial Committee on Road Safety, and experiments with the automatic control systems have been launched. France is also continuing its efforts to request the introduction of speed blocks in newly-built cars (see paragraph 4.1).

3.8 Other Actions

Rail Transport

T-1.5 Emissions Specific to Rail Transport

The SNCF will carry out a call for tenders to find more effective diesel motors.

Air Transport

T-0.3.7 Reduction of Emissions Specific to Air Transport

T-2.2.1 Consumption on Airport Platforms

T-2.2.2 Improvements in Combined Use of Air Transport and Public Transport

T-2.2.3 Pre- and Post- Conveyance By High-Speed Train

Direct lines linking high-speed train stations to the airport were set up at the Roissy-Charles de Gaulle and Lyon-Saint-Exupery train stations. Advance check-in was also enabled, most notably on the Brussels-Roissy line.

3.9 A Budget that Resolutely Favours the Least Polluting Modes

T-0.1.2 Financing Methods – FITTVN

T-0.1.3 Allocating Investments to the Various Modes of Transport

The Ministry of Transport's Budget reflects a major change in the financing of the least polluting methods. The FITTVN has been budgeted and incorporated into all of the budget lines related to transport, thus guaranteeing its lasting

effect. In addition, all of the transport lines have been brought together under a single budget, thereby allowing for side-by-side display of the various modes and facilitating future redistribution between the modes.

The State supplies financing of EUR 259 million (FRF 1.7 billion) to rail transport, making for an increase of over 10% as compared to the year 2000. The efforts underway since 1998 to foster the development of rail transport were seen in the doubling of the funding devoted to rail investments, when compared to those of 1997. A contribution of EUR 83.5 million (or FRF 548 million) is intended to fund the restoration and improvement of working railways, also showing an improvement of 10% in 2001, and bringing the total increase in funding devoted to the system to nearly 60%, compared to its 1997 levels.

With an increase of over 60%, loans to aid investment in urban public transport, including loans intended for the development and modernisation of the system, reached EUR 305 million (FRF 2 billion) within the national budget. That amount includes a grant of EUR 84.6 million (FRF 555 million) to aid in the implementation of the Urban Development Plans, as well as to facilitate actions intended to improve, modernise and ensure safety in urban public transport.

Beyond the efforts undertaken to modernise rail infrastructures and restore working railways, the development of alternative modes of transport for freight includes the expansion of integrated transport, which will be the driving force behind the development of rail freight transport. The Budget for 2001 will make it possible to continue the efforts underway to foster this development through:

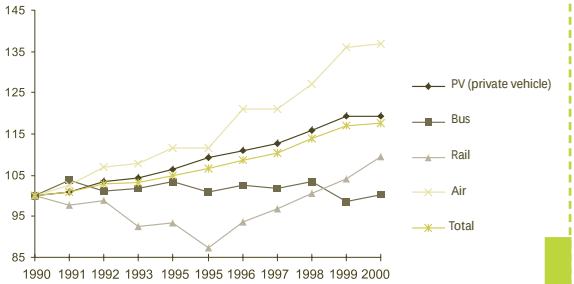
- a contribution of EUR 94.5 million (FRF 620 million) in favour of integrated rail-road transport, intended to compensate for part of the difference between the external costs of rail and roadways;
- a grant of EUR 18 million (FRF 118 million), which will make it possible to finance the construction and redesigning of terminals in order to remedy the overloading of existing terminals on the one hand, and incentives for the purchase of equipment specific to integrated transport, on the other.

The grants given to Harbour Authorities amount to EUR 129 million (FRF 847 million), as compared to FRF 804 million in 2000 and FRF 620 million in 1999. In addition, the economic calculating procedures used to choose projects will soon be updated, following the General Planning Commission's last report, to better take into account environmental problems (and, in particular, the cost of carbon).

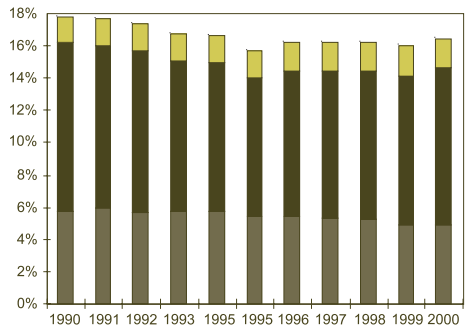
3.10 Concrete Results

Detailed analysis of the first preliminary figures regarding transport in 2000 shows that the actions carried out heretofore are already having a significant effect. Some of the changes that occurred in 2000 were, of course, due to the strong increase in the price of oil, which in turn affected the price of fuel. Nonetheless, the change carries on the trend observed since 1995.

Trends in Passenger Transport (base rate 100 in 1998)

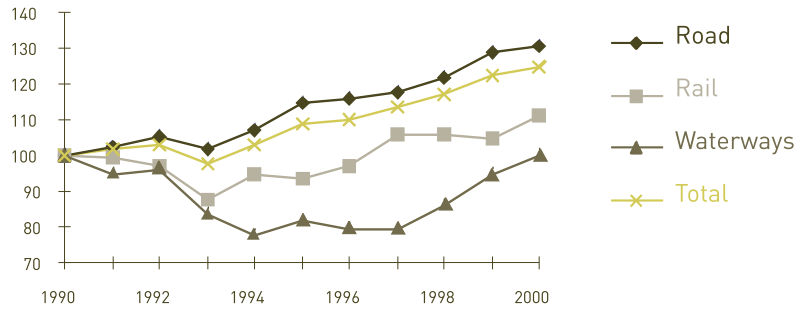


Share of Passenger Transport Not Using Roads



The most visible change is that which occurred in passenger transport: the percentage attributable to railways, after falling to an all-time low of 8.5% in 1995, has grown consistently and reached 9.7% in 2000. In contrast, the percentage of individual transport fell from 84.5% in 1995 to 83.5% in 2000. The trend in freight transport is less distinct, but it must be said that efforts in that field began much later. It is therefore understandable that the effects only become noticeable in 2000. Nonetheless, it is important to take notice of the constant and rapid increase in usage of transport via working railways since 1998 and that of sea freight, which improved by 3.9% between 1999 and 2000.

Trend in Freight Transport (base rate 100 in 1990)



Lastly, as concerns urban public transport, a strong increase is to be emphasised:

- In the Paris region, the Autonomous Parisian Transport Authority (RATP) recorded an increase of 5.1% in the number of passengers per kilometre in 2000, following an increase of 3.2% in 1999;
- In the provinces, we observed a rise of 3.9%, following a rise of 1.9% in 1999.

Overall, we observed, in 2000 and for the first time since 1974, a slight decrease in CO_2 emissions resulting from transport.

These first achievements, which come immediately after the budgetary reinforcements carried out since 1997, confirm the value of the measures taken, and confirm that our objectives in the fight against climate change through policy changes in Transport are, as a whole, being integrated.

4 Industry and Refrigerant Gases

Much like production in this sector, the sources of greenhouse gas emissions in Industry are extremely varied. The data with which we will deal in this chapter include emissions resulting from the production of energy by Industry for its own needs, but do not include the electricity that it purchases. CO_2 is preponderant in these emissions, but N_2O also ranks high on the list. Fluorinated gases (HFCs, PFCs and SF_6) account for 4% of these emissions, just as methane does. However, the latter gas will not be taken into account, as it results almost exclusively from the production of energy (extraction of coal and losses in the gas pipelines).

The data presented are those that resulted from the work carried out by the General Planning Commission. This ensures consistency between past estimates on emissions and projections for the future.

The industrial sector accounts for 23% of greenhouse gas emissions in France.

Industry ranks third amongst the sectors studied.

The emissions generated by Industry result mostly from a small number of branches, said to be "energy-intensive". In the past, these emissions showed a strong decline between 1970 and 1993, then stabilised. After declining by approximately 10% between 1990 and 1993, industrial emissions have now returned to levels closer to those of 1990. During the same period, the output of manufacturing industries increased by approximately 20%.

In addition, the consumption of electricity by Industry, including the steel-making industry, has significantly increased over the past few years, having gone from 18.7 MTOE in 1973 to 28.9 MTOE en 1997. Today, it accounts for 36% of electricity consumption in France.

4.1 Measures Relating to Carbon Gas Emissions

Existing measures

I-0.1 Public Grants in Favour of Industry

The public grants to industry that have a positive effect on the greenhouse effect include the system of exceptional depreciation for energy-saving equipment and grants offered mainly via ADEME and Regional Directorate for Industry, Research and the Environment. In early 1998, the French authorities decided to strengthen their policy on energy efficiency. The resulting decisions are described in further detail in the section on "New Measures", as they were decided upon after the 1997 Programme.

I-0.2 Voluntary Commitments

Several industrial federations have voluntarily committed to reducing greenhouse gas emissions.

In 1996, **Pechiney** committed to reducing the total amount of carbon gas emitted per tonne of aluminium produced by 19%, between 1990 and 2000. It further pledged to reduce CF4 emissions by 73%.

On 19 December 1996, **the French Steel Federation** committed to reducing: total annual C02 emissions by 10% as compared to 1990; specific consumption of agents reducing and combining fossil fuels by 16%; and C02 emissions per tonne of steel produced by 15%.

On 2 July 1996, **the National Syndicate of Manufacturers of Rich and Magnesium Limes**, committed to reducing to 5% per tonne of lime produced, both the quantity of carbon gas emitted (in kilograms of C02 per tonne) and the quantity of thermal energy used (TOE).

The French Cement Industry Union plans to reduce all of its C02 emissions resulting from the consumption of fossil fuels by 25% between 1990 and 2000, making for a decrease of 10% in the same emissions per tonne of cement of products produced (10 October 1996).

The French Mechanical Glassworks Union, which represents the field of glass used in packaging, plans to reduce carbon dioxide emissions by 10% between 1990 and 2005 by recycling glass, improving the efficiency of its glass ovens, and improving the equipment on its dual-energy systems (commitment signed in February 1997). This agreement provides for intermediate objectives to be set every three years, starting from the time of its signing.

Given the pivotal role that Industry plays in setting objectives, on the one hand, and the difficulties inherent to control and individual sanctions, on the other hand, the effectiveness of such agreements where the environment is concerned might be called into question. In light of how ambitious our objectives are for 2010, we do not feel that voluntary commitments of this kind should be given priority by the government as part of the new programme to fight against the greenhouse effect. However, in certain cases, agreements between companies and the State might be used, in particular to limit emissions on the basis of annual objectives, when accompanied by an inspection plan and specific penalties in case of non-compliance.

I-0.3.2 Regulations on Boiler Output

As regards C02 resulting from energy sources, the Law on Air and Rational Energy Use serves as the legal foundation for regulatory action. The decrees issued on 11 and 16 December 1998, designed to enforce this law, rendered mandatory an increase of nearly 10% in the energy output levels of boilers whose power is between 400 kW and 50 MW. It also simplified and modernised the inspection procedures by approved third parties, with which all companies using combustion equipment of over 1 MW must comply. Specific instructions were provided so that this mandatory inspection procedure on large combustion units is better respected. The mandatory inspection of energy-use conditions for major users, which existed previously, has been replaced by an incentive mechanism that offers guidance to SMEs, as part of the work of the Regional consulting grant funds(FRAC).

I-0.4 Existing Taxes Having a Bearing on the Greenhouse Effect

In France, Industry, and especially "energy-intensive" industry, still enjoys special status when compared to other sectors, as stated in the White Paper on the Modalities of Extending General Tax on Polluting Activities to Intermediate Energy Consumption by Companies. The Paper also specifies that companies are often subject to lower taxes in France than in other countries, where energy consumption is concerned.

Regarding natural gas, taxes in France (Inland Duty on Natural Gas Consumption – TICGN) only applies once consumption levels go beyond 5 TWh, with the monthly limit being 0.4 GWh. In fact, of the 400 TWh of natural gas consumed in France in 1997, 126 TWh were subject to the tax. 98% of these 126 TWh were consumed by the 2,900 industrial companies that are subject to the TICGN. Overall, most industrial consumption of natural gas is subject to tax (the TICGN), but at a rate lower than the Community's average of 40%.

As regards heavy fuel and coal, the usage of which mainly involves Industry, the taxes charged in France are either lower than the Community average, as is the case with heavy fuel, or non-existent (as is the case with coal).

New Measures

I-1 Measures Relating to Grants for Industry

The following actions have been listed in ADEME's enterprise plan for the period between 2000-2008, as well as in the National Programme for Energy Efficiency Improvement (PNAEE).

I-1.1 Revival of Aid in Decision Making through ADEME and FRAC

The average annual endowment will be approximately FRF 40 million (EUR 6.1 million), and will be taken out of ADEME's overall budget. The Regional Consulting Grant Funds will also offer credit for this initiative.

I-1.2 Research and Development

This section includes orientation of long-term choices, and improvement of technologies and processes using financial grants for R&D (average annual budget of FRF 20 million, or EUR 3 million).

I-1.3 Technological Demonstrations

This section deals with support for exemplary demonstration projects (average budget of FRF 30 million, or EUR 4.6 million).

I-1.4 New Methods of Financing

Along with the banking sector, ADEME will participate in the elaboration of new methods of financing for companies. The Guarantee Fund for Investments in Energy Control (FOGIME) and the Intervention Fund for Environment and Energy Control (FIDEME) will provide the support needed for investment projects. They will, respectively: guarantee loans that SMEs contract with banks for actions designed to better use energy; and offer support through quasi-equity to projects that are both profitable and

beneficial to the fight against the greenhouse effect, and which would not be able to be benefit from bank financing. When deployed in this manner, the annual investment plan might involve up to EUR 229 million (FRF 1.5 million), 3% of which would come from ADEME, in the form of a guarantee for FOGIME.

I-1.5 A Single Operating Mode for ADEME and FRAC

In order for this programme to have all of the effectiveness that one is entitled to expect of it, it will be necessary for it to be promoted and handled in accordance with a single operating procedure. From the user's point of view, procedures and policies must be completely identical, regardless of whether the funds come from ADEME or from Regional Consulting Grant Funds.

I-2 Regulatory Measures

If necessary, the new regulatory measures concerning CO_2 will be implemented along with a set of tradable permits.

Measures are being taken so that they can be implemented within the framework of the "Best Available Technologies". These are currently under debate within the European Union, as part of the process leading up to the implementation of the IPPC Directive.

It must also be emphasised that not all of the sectors could be addressed. This was, in particular, the case with electrical motors and their output. Normative or regulatory measures will have to be studied regarding the use of industrial electric motors, used for instance, in the circulation of fluids, as well as on equipment for the production of compressed air, machine tools, transport of materials, and refrigeration equipment.

I-3 Taxation of Energy and the Case of Energy-Intensive Industries

In the industrial sector, the PNLCC called for the implementation of tax measures on energy, on the same basis and at the same levels as for other sectors. In light of the events that have taken place in the field of energy since the adoption of the programme, the government has been forced to suspend the implementation of these fiscal measures (see paragraph 7.1).

Our reasoning is based on the context established by the European Draft Directive, which restructures the Community's framework on taxation of energy products, and the contribution of the French government to the Draft Directive, dated April 1999 and known as the French Memorandum.

There exist no regulatory or restrictive measures toward these industries in the proposed Finance Law for 2002. However, the implementation of fiscal measures such as those planned in the PNLCC, and according to the terms listed above, may still occur. We will also make efforts to encourage industrial players to sign voluntary or negotiated agreements as early as 2002, in view of the upcoming establishment of a European emissions permit market, set to take place in 2005, and possible experiments at the national level, starting as early as 2003.

Labelling, Information and Training

I-5.1 Labelling and Standardisation

The continuation and reinforcement of a labelling policy play an important part in policymakers' decisions, especially in highly technical fields such as these. In particular, as was recommended in the Assessment Report on Energy Control, it is advisable to ensure that the requirements for the obtaining of the NF label be designed in such a way that they evaluate actual energetic efficiency in a sufficiently thorough manner. Similar rationale will be used where electrical motors are concerned.

Including energy control amongst the requirements for commercialised equipment is, in our view, an unavoidable step if we are to reduce energy consumption. At the end of 1998, the State Secretariat for Industry requested that AFNOR launch a major standardisation programme on energy control. A Steering Committee, headed by ADEME and composed of representatives from the government and from Industry, was created for this purpose. A General Strategy Document was published in

2000 and a joint action plan was elaborated. The Steering Committee submitted a request to the European authorities so that an equivalent structure could be set up at the European level.

I-5.2 Information for Companies

We will continue to develop actions to inform companies. These actions will have a broader scope than those designed for the Quality Labels. The objective is to allow companies to make their own choices, in particular when replacing heating or combustion equipment or when making new investments, on the basis of up-to-date information about the energy saving and the fight against the greenhouse effect. The areas in which it seems particularly important to make progress include certain equipment or combustion units on which, for the moment, there is not sufficient efficiency-related information. This is particularly true of the combustion units and electric motors used by SMEs.

I-5.3 Training and Qualification

The qualification of workers has a direct influence on the quality and effectiveness of certain measures taken as part of the fight against the greenhouse effect. This is particularly true of the engineers responsible for installing and operating boilers and electric motors in the SMEs. Some topics that might be covered include optimal installation and running conditions for equipment, as well as the choices that must be made to find the most effective materials and the benefits that can result from those decisions for users, in particular where energy saving is concerned.

4.2 Controlling Nitrogen Protoxyde Levels in the Chemical Industry

Existing Measures

I-0.3.1 Regulation of N_2O Emissions

The reference framework for current regulations is composed of: in French legislation, the Law on Air and Rational Use of Energy and the law relating to plants that have been classified as protecting the environment; and, in European legislation, the IPPC Directive, issued in 1996. Where N_2O emissions generated by industrial complexes are concerned (production of adipic acid, glyoxal and glyoxilic acid), the regulations are applied on a case-by-case basis, by order of the prefect, as specified in the legislation on classified installations. An incentive effect on industrial players to treat their waste has been observed. Where the production of nitric acid is concerned, the Ministerial Decree of 1 March 1993, later taken up by the Decree of 2 February 1998, limits N_2O emissions to 7 kilograms per tonne of nitric acid produced.

I-0.4 Existing Taxes

N_2O emissions from industrial sites are currently subject to tax under the TGAP, which amounts to 250 francs per tonne emitted, or EUR 0.125 (FRF 0.82) per tonne of CO_2 equivalent. The same amount applies to other nitrogen oxides. No other specific tax was identified by the Working Group on Industry.

Effects of Existing Measures

Emissions from the various factory floors (production of adipic acid, glyoxylic acid, nitric acid and glyoxal) **developed according to the following trend:**

- In 1990: 89 600 tonnes of N_2O, or **27.8 $MtCO_2e$** (5% of total emissions of greenhouse gases in 1990);
- In 1999, 35,875 tonnes, or **11 $MtCO_2e$**, thanks to the measures adopted under the First Programme for the Fight Against the Greenhouse Effect.

The objectives set regarding **adipic acids** in the 1995 Greenhouse Programme, have nearly been reached: thanks to the opening of a treatment facility in 1997, the level of emissions, which stood at 60,000 tonnes in 1990, fell to 14,600 tonnes. The result appears low because it concerns only one operating facility. However, it does enable significant **reductions** in CO_2 equivalent levels, of **approximately 14.3 $MtCO_2e$**.

New Measures

It is important that these complement existing measures for the reduction of nitrogen protoxyde in the chemical industry by making use of techniques such as thermal cracking and catalytic decomposition. The efforts must extend in the two following directions: maintaining present efforts to optimise waste treatment systems on sites that produce adipic acid, glyoxal and glyoxylic acid; and implementing catalytic waste treatment systems in nitric acid production facilities, with the aim of reaching an optimal efficiency level of 90%. The devices to be used include the legislation on installations classified as protecting the environment (decrees for the enforcement of the 1976 law); the general tax on polluting activities (Finance Law); and the government investment grants, managed by ADEME.

I-2.1 N_2O: Strengthening of Regulatory Requirements within the Framework of the ICPE Legislation

This measure will be implemented through decrees issued by the Ministry for the Environment and by order of the prefect.

I-4.2 Increase in the Generalised Tax on Polluting Activities (TGAP) in the case of N_2O

Very large reductions in emissions, already incorporated into the projections issued under the last programme, are currently being implemented where N_2O emissions of industrial origin are concerned. They are based on the actions implied by the legislation on classified installations. The current tax, which is part of the TGAP, is very low (amounting to approximately EUR 0.125 per tonne of carbon equivalent) and will be increased in order to better reflect the contribution of N_2O to climate warming.

The expected benefits to greenhouse gas emissions include the continuation of reductions already achieved and a reduction of up to 25 $MtCO_2e$ between 1990 and 2010, making for a total emission reduction of nearly 90%.

(As for the actions undertaken since the beginning of the year 2000, they are expected to lead to 6.6 $MtCO_2e$.)

As concerns **the cost of the new measures**, it amounts to **approximately EUR 1.1 per tCO_2e avoided** for the factories producing nitric acid, or an increase of a few percentage points in the production cost of this product. The cost is lower for other materials produced. The table below illustrates these changes.

In tonnes	N_2O Emissions 1990	N_2O Emissions 1990	N_2O Emissions 2010
Adipic Acid	57,500	14,600	12,000
Gyoxylic Acid and Glyoxal	6,400	8,000	500
Nitric Acid	25,600	13,000	1,300
Total	**89,500**	**35,600**	**13,800**
Total CO_2 Equivalent	**28 $MtCO_2e$**	**11 $MtCO_2e$**	**4,3 $MtCO_2e$**

This scenario, as established by the government, reflects optimal levels and must be negotiated with the relevant professional players. The actions will involve mainly:

- **The production of adipic acid:** the objective is to fine-tune the treatment system currently used in Chalampé to offset the possible increase in production levels;
- **The production of nitric acid:** numerous discussions between DPPR, ADEME and the industrial sectors (in particular, the company Grande Paroisse and Hydro Azote) are being held in order to make decisions pertaining to the nitrogen protoxyde treatment facilities. A high-temperature catalytic destruction process has been defined. It is expected to enable a 90% reduction in N20 emissions. Industrial-scale trials are

underway on one of the sites. If the process proves successful, several nitric acid production sites could be equipped with the system. Thanks to this, it is likely that the facilities needed to bring about the expected reductions in N20 levels in the nitric acid production sector will be up and running within a few years, and well before 2010.

4.3 Industrial Fluorinated Gases

With regard to these different industrial gases, a strategy has been defined to take into account the diverse situations of the industries involved, the highly open nature of a certain number of markets (semi-conductors, foams), the need to give priority to **solutions that are effective in the long term,** and the share of each sub-sector in total greenhouse gas emissions. In addition, in each sector, it is recommended that an **integrated approach** be adopted in the fight against the various forms of pollution in order to avoid a situation where a measure intended to limit one pollutant actually fosters the development of another one.

It is nonetheless important to recall, as the Member States of the European Union declared at workshop in Utrecht, that **in the long run, HFCs, PFCs and SF_6 cannot be considered viable substitutes to substances that alter the ozone layer.** This implies that research will have to be an important component of future policies, with a view to ultimately developing technologies that make it possible to do without greenhouse gases entirely.

At the request of the French Ministry for Urban and Rural Development and the Environment, a **study on the potential of actions to reduce emissions in France** was carried out in June 2000 by CITEPA for all of these sectors. On the basis of those results, discussions were launched with the industrial players.

In addition, by the end of 2001, **it will be mandatory to declare, each year, all polluting emissions** from classified installations subject to authorisation. This requirement was established by the European Registry of Pollutant Emissions. This declaration should make it possible to keep track of emissions from substances that result from industrial manufacturing, as well as measure them.

It is also intended that certain measures be taken mainly at the Community level, as a result of the opening of the markets: semi-conductors, foams, aerosols and fire-extinguishing materials fall under this category. The regulatory requirements are expected to act as reinforcements for the measures voted at the European level and, if necessary, as a replacement, when the Community-wide measure cannot be fully executed.

According to a study carried out by CITEPA, the combined effect of these actions is expected to bring about the following reductions in emissions in 2010:

Gas, Application	Recommended measure	Emissions avoided ($teCO_2$)	Cost ($F/teCO_2$)
SF_6 used in magnesium foundries	Replace SF_6 with SOP2 (by voluntary agreement and decrees for the protection of personnel working on the sites	1,365,000	1.75
PFCs in the production of first fusion aluminium	Replace of the anode in carbon with an inert anode (Encourage research with a view toward improving the process in the short term)	855,000 81,000	58.6
SFC and PFCs used in electrical equipment	Reduce gas release during filling procedure and during maintenance operations	1 380,000	123
HFCs used in (non-medical) aerosols	Limit the usage of JFC 134-a to critical applications where inflammability is limited (15% of current use of fluorides)		

Source : CITEPA, 2000

I-2.2 PFCs in the Production of Aluminium

A regulation will be established in co-ordination with the concerned industrial players in order to ultimately limit average PFC emissions (in the present case, CF4) per tonne of aluminium produced (to be studied according to the technologies involved) and guarantee the proper monitoring of emissions levels.

A major technological leap was achieved in 1993, thanks to the completion of a technique using cells with pre-baked anodes and automatic direct supply to the center of the cell. As the situation stands, no additional technological leaps can be expected in the very near future.

Heretofore, no specific measure has been voted upon, seeing as the production of aluminium belongs to the set of incentive measures that are supposed to compensate for an attenuation in the energy component of the TGAP. It is nonetheless possible to foresee two avenues:

- In the short term, measures for the optimisation of the industrial process, which Industry sees as workable at a low cost, should make it possible to reduce emissions by 10% as compared to a scenario in which no measures are taken;
- In the medium term, the continuation of research and development efforts on promising techniques, such as inert anodes, could lead to the elimination of CF4 and C2F6 emissions.

I-2.3 SF_6 and PFCs from the Electronics Industry

Regulations will be established using the 1976 legislation on classified installations for the protection of the environment, with a view, in particular, toward reaching a satisfactory recovery or elimination rate for gases emitted in the new units, but also to ensure proper monitoring of emissions.

In April 1999, all of the employers' unions within the semi-conductor industry, under the aegis of the World Semiconductor Council, signed a unilateral commitment to reduce emissions from fluorinated gases used in the semiconductor industry by 10% as compared to the levels recorded in 1995 (in CO_2 equivalent).

The final report of the European Programme for the Fight Against the Greenhouse Effect (Group 5 – Industry) proposes that this agreement be recognised and monitored at the European level. The very open nature of the markets, which will breed strong international co-ordination amongst industrial players, can but lead to similar co-ordination within the European political arena.

Several written exchanges and meetings have already taken place with French representatives of the semiconductor industry in 1999 and 2000. These led to the conclusion that, at the present time, the reduction technologies that would be the most viable in the long term are not yet operational. It is therefore the duty of the Ministry for Urban and Rural Development and the Environment, along with the Regional Authorities on Industry, Research and the Environment, to perform annual emissions inspections, site by site, and to evaluate to what extent the agreement is being respected and what its prospects are. A review will be carried out in two years' time, taking into account the developments in research and in actions carried out at the European level by that time (see above). If necessary, actions will be decided at the national level, combining voluntary agreements and complementary decrees, within the framework of the legislation on classified installations.

I-2.4 SF_6 in Magnesium Foundries

Regulations will be elaborated in co-ordination with the affected industries, on the basis of the 1976 legislation. The policy on limiting emissions should be applied at two levels. In the short term, a policy to improve the industrial process could be implemented and, if necessary, be bolstered by the regulations intended to reduce consumption of SF_6 per tonne of magnesium produced. At the same time, this should be handled at the European level by developing a "Best Available Technology" under the IPPC Directive. In the medium term, given the high cost of SF_6 and its high global warming potential, it seems advisable to plan for facilities that make it possible to use sulphur dioxide once again as a replace-

ment for SF_6, while fully protecting workers from the emanations. This solution, along with the search for other products that can replace SF_6 appears the most economical in the end for certain sites (see aforementioned CITEPA study).

I-2.5 SF_6 in Electrical Equipment

Given that the number of players concerned is very low and that no replacement product has yet been identified, it will be necessary to reach an agreement on emissions levels. Technical regulations that ensure proper monitoring of emissions and limit fugitive gases, in particular on equipment that is at the end of its life cycle, should be considered when necessary. Discussions held with industrial representatives and EDF provided an opportunity to define the efforts needed from now until 2010. These include measures designed to limit emissions during the production and maintenance of equipment, and to recover SF_6 once the equipment reaches the end of its life cycle.
A voluntary agreement is currently being discussed with the equipment manufacturers (GIMELEC), and could be extended, whenever needed, to include EDF for all matters relating to the transportation and distribution of electricity. If it is not possible to reach a voluntary agreement, or if the said agreements are not upheld, ICPE legislation or other measures of regulatory nature can be used.

I-2.7 HFCs in Foams, Aerosols and Fire-Extinguishing Materials

On the basis of broad foundation studies currently being performed by CITEPA and ADEME, measures intended to limit emissions in these sectors are being examined with industrial representatives. In addition, emissions limits on HFCs (rubric 1185) will be proposed within the framework of the 1976 legislation on classified installations, as will limits on refrigerating and compression equipment (rubric 2920).
As regards the conditioning of fluids in the various types of equipment, the current regulations on classified installations intimate that gases emitted during the production process should be recovered. Annual fluid losses should be limited to 2%. Requirements will thus be adopted, either in the form of decrees that complement the present enforcement decrees, or in the form of decrees specific to the installations subject to mandatory declaration requirements (to be issued by the end of 2001).
In addition, discussions already underway with professionals regarding applications such as extruded polystyrene foams, polyurethane foams and non-medical aerosols are expected to lead to the definition of actions that complement the requirements already existent within the ICPE regulation. Amongst these actions, we will consider the possibility of limiting the use of HFCs to applications where, for security reasons (inflammability if hydrocarbons are used) or other technical reasons, no other fluid can be used. We will also promote products that do not make use of HFCs and encourage the development of recovery facilities for fluids at the end of their life cycle. This type of action will be carried out both at the European level (via the Directive to be adopted) and at the national level.
Already, The European Aerosol Federation has elaborated a Code of Good Practices, regarding the usage of non-medical aerosols. In this document, it sets out the essential uses of HFCs. The extruded polystyrene foam industry has also proposed a voluntary agreement at the European level.

4.4 Refrigerant Gases

Existing Measures

I-0.3.3 Regulations Relative to Refrigerant Gases

The decree issued on 7 December 1992 establishes requirements on the sealing of refrigeration equipment containing more than 2 kilograms of HFCs. It affects approximately 2 500 companies, most of which are of commercial nature.

New Measures

The PNLCC calls for several sets of measures, with the aim of limiting the increase of HFC emissions in the cold storage and air conditioning sectors. Together, and when enforced fully, these measures are expected to ultimately limit emissions to 2.9

$MtCO_2e$, as compared to 8.8 $MtCO_2e$, for a maximal improvement of 5.9 $MtCO_2e$, according to projections established by the Energy Centre at the Ecole des mines in Paris.

F-3.1 Reinforcing Controls

In order to pave the way for broader application of the 7 December 1992 decree, a policy expanding inspection procedures has been issued. Reviews will be carried out, and will be followed by more rigorous inspections in the years to come. The services of private establishments may be used if deemed necessary.

F-3.2 Limiting Emissions from Air Conditioning Equipment in Motor Vehicles

A working group guided by the Ministry for Urban and Rural Development and the Environment is studying measures that will make it possible to limit the increase of emissions resulting from automobile air conditioning systems. The measures currently being considered include the partial extension of the 7 December 1992 decree (prohibiting degasification in the atmosphere while adjustments are being made by engineers and making it mandatory to recover whatever gases are lost), and compliance inspections, along with actions to increase public awareness.

F-3.3 Efforts toward Standardisation

The EN 378 standard is currently being revised, with a view toward ensuring greater quality in the piping systems, and protecting equipment from excessive pressure.

F-3.4 Actions Facilitating the Recovery of Fluids at the End of Life Cycle

The Energy Centre of the Ecole des Mines in Paris performed a study at the request of the Ministry for Urban and Rural Development and the Environment. The study concluded that work needs to be carried out along two lines: reinforcing the 7 December 1992 decree where large equipment is concerned and, specifically, the obligation to recover fluids at the end of the life cycle; and implementing a refund system on fluids that will provide financial incentive for recovery.

On this basis, an interministerial working group is preparing a set of measures that complement the 7 December 1992 decree, in order to establish the accountability of relevant players in the cooling industry, as concerns the recovery of fluids at the end of equipment life cycles.

Alongside that, three types of initiatives should be noted:

- The European Directive of 18 September 2000 regarding vehicles that are no longer in use requires that, when a vehicle is demolished, the fluids be collected and recovered separately, in particular, CFCs and HFCs. A decree is currently being prepared to incorporate this text into French law;
- A European draft directive relating to electrical and electronic equipment at the end of its life cycle is currently being discussed. Its is also expected to cover some refrigerating equipment;
- Lastly, the convention between MATE, ADEME and the cooling professions on the recovery of cooling fluids is currently being revised, so as to make the recovery of fluids at the end of equipment life cycles more appealing.

F-3.5 Training and Qualification of Companies Working on Refrigeration or Air-Conditioning Equipment

A Working Group on the revamping of the 7 December 1992 Directive relating to cooling fluids is studying measures that will make it possible to improve the text's current provisions regarding certification to be issued to companies by the Prefect and the associated qualifying conditions. Training programmes and, if necessary, conditions for qualifying automobile air conditioning operators might also be elaborated.

Amongst the most cogent measures studied by the working group, we should mention the prohibiting of fluid sales to any company not complying with the

conditions defined in the decree. This measure, which has already been applied successfully in The Netherlands, is also expected to be included in the future directive proposed by the European Commission, as part of the European Programme for the Fight against the Greenhouse Effect.

F-3.6 Fiscal Measures

The implementation of a tax on fluorinated gases (which is expected to come as an extension of the air component of the TGAP) and its economic impact on the cooling sector were the focus of a study that was submitted to the Ministry for Urban and Rural Development and the Environment by Dominique Ami, in 1999. This study shows that the tool's effectiveness varies from sector to sector, insofar as the ratio between the cost of cooling fluids and the cost of equipment can vary greatly according to the application used. The same is true of the viability of alternative fluids, which, in order to prevent fires, cannot currently be used in several subsectors of the cooling industry. In addition, the possibility of creating a European taxation system on these gases has been discussed within the framework of preparations for the European programme on the fight against the greenhouse effect. While some countries (Italy and Denmark) are in favour of this, the majority of Member States have stated that they oppose such an initiative.

Given this background, it is more likely that an extension of the TGAP at a very low rate will be included in the upcoming Finance Acts, the purpose being to send a powerful message.

F-3.7 Research and Development

ADEME devotes research resources totalling FRF 10 million per year to this sector, and organises its work along two lines: enabling the usage of existing fluids with greater energetic efficiency; developing fluids with low global warming potential.

In addition, the Energy Centre at the Ecole des mines in Paris is working to develop alloys that have low global warming potential (lower than 700) and are not inflammable.

5 Agriculture and Forestry

5.1 Emissions and Removals in the "Agriculture – Forestry" Sector

Contrary to the other sectors taken into consideration in the programmes designed to reduce greenhouse gas emissions, the fields of Agriculture and Forestry, and the products that result from them, do not only constitute sources of carbon gas, methane and nitric oxide; they also encompass the sinks where carbon gas is absorbed, thanks to photosynthesis.

The use of biomass for energy-related purposes (biological fuels), as a replacement for fossil fuels, along with the usage of biological materials in lieu of other materials with higher energy content but greater polluting potential during their production and usage, also make it possible to reduce carbon gas emissions.

The "Agriculture – Forestry" sector is responsible for nearly 18% of France's overall greenhouse gas emissions.

However, the net increase in carbon stored in UTCFs is not taken into account in this figure. In 1997, they represented CO_2 removal of approximately 10% in the figure quoted above.

The emissions generated by the agricultural sector were relatively stable over the period between 1990 and 1997, and the projections developed heretofore show that this trend should continue until 2010. The net result for the forestry sector, as currently defined by the Kyoto Protocol, in the first commitment period, is expected to be 2.4 $MtCO_2e$ by 2010.

5.2 Main Existing Measures

Agricultural Sector

France's 1997 Programme for the Fight Against the Greenhouse Effect included few resolute actions for the control of emissions in the agricultural sector, as the said emissions had not yet been well identified at the time it was elaborated. However, it did describe the impact of certain changes in agricultural policy on greenhouse gas emissions. These included the continuing intensification of milk production, the relative extensification of bovine production, the increase in production beyond French borders, the development of government policy on storage of liquid manure, limits on the usage of nitrogen-enriched manure (mandatory crop rotation, the fight against nitrate-based water pollution through improvements in fertilisation processes). At the same time, the research and development programme AGRIGES was developed in order to learn more about this sector and, ultimately, be in a position to intervene effectively. This programme received incentive credits of approximately FRF 2.5 million (EUR 381,000) per year from 1992 to 1998. The GICC Programme followed from that.

Lastly, France engaged in an industrial-scale experiment to test new methods for producing and distributing bio-based fuels (ethanol and vegetable oil methylester). This undertaking uses approximately 400,000 hectares of land and reduces emissions by 1 $MtCO_2e$ per year.

Forestry Sector

The actions described in the 1997 programme in this area were built around three main ideas:

- *Storing carbon in forests, through the revival of the policy on afforestation farmland (doubling of the annual rate, with aid possible up to 30,000 hectares per year);*
- *Storing carbon in products from forestry, by developing the usage of wood in the buildings sector;*

Usage of wood energy, in particular for collective heating, within the framework of the "Wood Energy and Local Development" Plan.

5.3 New Measures

A-1.1 Reducing Emissions of CH_4 from Cattle Breeding

In the breeding sector, there exist no viable technical actions that might reduce CH_4 emissions resulting from enteric fermentation in ruminating animals. However, technical solutions do exist to limit CH_4 and N_2O emissions resulting from the handling of excrement from intensive breeding, which will amount to approximately 3.3 $MtCO_2e$ in 2010. The section pertaining to Breeding in the Programme for the Control of Pollution of Agricultural Origin, implemented in 1994, was designed to improve the management of animal waste and to reduce all forms of water pollution, and in particular, water pollution resulting from nitrates. After an assessment of the programme, the Prime Minister decided to adjust its objectives, so as to improve its environmental effectiveness and equity. While it is possible that the increase in storage capacity necessary to avoid spreading during periods where water quality is particularly threatened, may bring about an increase in CH_4 emissions, the improvements achieved in handling nitrate fertilisers will lead to a decline in N20 emissions. *The Ministry of Agriculture and Fishing will review the technologies that make it possible to control these emissions, making use, if necessary, of the appropriate research bodies (INRA, CEMAGREF, IFP, etc.) in order to develop research and development initiatives. Concrete recommendations on how these emissions can be reduced will have to be issued in 2002.*

A-1.2 Reduction of N_2O Emissions in Soils

With the proposed law on water, which is currently being studied, *France is headed toward implementing a fee on excess nitrogen of mineral or organic origin, based on overall production of each farm, in order to protect water from nitrate pollution. This measure would carry the additional benefit of limiting nitrogen protoxyde emissions.*

A-1.3 Integration of Concerns Relating to the Greenhouse Effect in Agricultural Policy

Preliminary analyses show that the way in which the bovine breeding sector is organised (in particular, its degree of intensification) has a strong impact where the emission and removal of greenhouse gases is concerned, through complex interplay of a number of reactions.

The Ministry of Agriculture and Fishing is exploring this topic further, in both its technical and economic aspects, so that the "prevention of climate change" aspect can be fully taken into account as the national support programme for bovine breeding is elaborated.

A-1.4 Actions to Improve Knowledge

This involves, in particular, the following areas:

- *the replacement of fossil-based products with biomass, in particular bio-based fuels (including wood energy), and raw materials for the chemical industry;*
- *options available for limiting CH_4 emissions resulting from enteric fermentation of ruminating animals: taking into account the high volumes involved, this area will have to be one of the main priorities of INRA in the field of bovine breeding;*
- *causes of N20 emissions in soils, the objective being to carry actions beyond the sole topic of nitrated fertilisers;*
- *CO_2 emissions and removal in soils (simplified working of soils, better handling of residues from cultures, promoting the use of compost based on household waste or from sludge made by purification plants, etc.), including the launching of long-term experiments.*

The Forestry and Wood Sectors

A-2.1 Afforestation of 30,000 Hectares of Farmland Per Year

This measure reasserts the increase in grants for the afforestation of farmland, with the aim of reaching an annual rate of 30,000 hectares per year by 2006. The project had to be modified to make allowance for the 1999 storms, but the initial objective will be maintained in the longer term. *The National Plan for French Forests, adopted after the two storms* of December 1999, *provides, in particular, various forms of aid for the replenishing of 300,000 hectares of forest over 10 years. The redistribution of financial and human resources initially led to a decline in the afforestation of farmland, which fell to less than 10,000 hectares per year*, a level that is in compliance with the recommendations listed in the Kyoto Protocol (Article 2.a.II), to the benefit of the forest replenishment effort. The annual afforestation rate is expected to increase and reach approximately 20,000 hectares per year in 2006. Beyond that, the human, technical and financial resources needed to reach an annual afforestation rate of farmland equivalent to 30,000 hectares after 2006 will be re-evaluated in 2005.

A-2.2 Studies, Research and Experiments

It is important to remember that a systemic approach, including sectors such as that of energy, is necessary to identify the true possibilities for reducing greenhouse gas emissions, including all gases and at the national level (in particular, the possibilities of wood energy and wood-material).

THE SUBJECTS THAT REQUIRE FURTHER STUDY INCLUDE, IN PARTICULAR:

- ***Economical planting methods for farmland that has already become fallow***
- ***Potential for developing trees outside forests***
- ***Improvement in the estimates of change in carbon storage resulting from the various land use changes.***
- ***Reasons for and possibilities of limiting detimbering.***
- ***More systemic studies with a view toward clarifying the overall effect of various agricultural methods, more or less intense production systems and agricultural policies on the warming of the atmosphere.***
- ***Studies on analysis cycles of product life span, incorporation dimensions such as land use, transport, potential for change in agrarian systems; possibilities and methods for taking into account, in land exploitation contracts, the production or gathering of wood and various other forms of biomass by farmers.***
- ***Studies intended to better quantify variations in flow and storage of greenhouse gases will also be undertaken.***

6 Waste Management

Greenhouse gas emissions from the Waste sector come from two main sources: methane emissions resulting from the anaerobic fermentation processes on landfill sites; CO_2 emissions due to the incineration of waste of fossil origin (mainly plastic matter). The share of the Waste sector in greenhouse gas emissions in France is relatively low, at approximately 3%. The emissions generated by the Waste sector declined by 20% between 1990 and 1997 and, in 2010, are expected to be 25% lower than in 1990, under the impetus of the measures described hereafter. As compared to a scenario "with existing measures", we would achieve a decrease of 4.8 $MtCO_2e$ per year in 2010.

6.1 The Principal Existing Measures

In 1997, France's Programme was *based on strict application of the "Waste" Law adopted in 1992, which was interpreted as prohibiting the storage of any putrefiable waste in dumps starting in 2002. This change was made possible thanks to significant developments in incineration. In addition, it called for important investment efforts where the capture of bio-gases was concerned, a requirement that was to apply to 80% of sites in 2010. Given this background, and seeing as a significant increase in waste production and the share therein of plastic materials was expected, the decrease in CH_4 emissions was more than balanced out by the increase in fossil CO_2 emissions resulting from incineration. Overall emissions generated by the sector were therefore expected to grow from 11.7 $MtCO_2e$ in 1995 to 15 $MtCO_2e$ per year in 2010, whereas the amount of CO_2 emissions avoided thanks to the productive usage of heat generated by incinerators was to grow from 2.2 to 3.7 $MtCO_2e$ per year over the same period.* The latter effect was therefore not significant enough to outweigh the former.

6.2 New Measures

The PNLCC was elaborated on the basis of the new direction given to waste policy starting in 1998.

DE-1 Controlling Waste Production
DE-2 Developing Better Use of Materials and Organic Matter

Recycling half of waste materials into material or organic matter. The remaining quantities to be managed, half by incineration, half through storage, in 2010.

DE-3 Recovery of Heat Produced by Incinerators

An analysis will be carried out on the recycling of energy in each of the various professions, and in particular with a view to developing recycling in the form of heat from the energy produced. It should be noted that the final effect of incineration where greenhouse gas emissions are concerned depends on the way in which the energy will be re-used.

DE-4 Effectiveness of Capture Systems in 2000

Recovery rate going from 60% to 80% starting in 2000. The capturing of methane in waste dumps will make it possible to prevent CH_4 emissions to the tune of 15 $MtCO_2e$ per year in 2010 and 9.5 $MtCO_2e$ per year in 2020.

To complement this, plans have been made to go further in the assessment of capture systems (including the implementation of a campaign to measure CH_4 emissions at dump sites, with a view to acquiring the necessary technical references) and to continue research on the materials, network design, and operating conditions that make it possible to improve capture (exploring the possibility of attaining and surpassing the targeted 80% recovery rate).

DE-5 Assessing the Potential of a Biological Pre-Treatment Method

Such a treatment would make it possible to reduce methane emissions on dumps that are still operating, in other words, before the capture system is implemented.

DE-6 Analysis and Control of Biochemical Reactions on Dump Sites

DE-7 Agronomic Recycling of Organic Waste

This measure involves *studying the level of quality that such an avenue could reach (economic and environmental conditions, acceptability at the local level). Given these conditions, the emissions levels would be the following in 2010 and 2020:*

$MtCO_2e$ per year	2010	2020
Dumps	5.5	4.8
Incineration	4.4	5.1
Energy Replacements	- 2.9	- 3.3
Result	**7.0**	**6.6**

7 Inter-Sector Measures

7.1 Ecological Tax on Energy and Carbon

The PNLCC's centrepiece is the introduction of an ecological tax on energy and carbon. This excise was originally supposed to apply to the intermediate energy consumption of companies starting in 2001, then be extended, over the course of the programme, meaning by 2010, to all forms of energy consumption in all sectors of activity.

Given the rise in the price of oil and natural gas since the programme was adopted, the project was suspended until further notice. The government is working to come up with compensatory factors, which will be based on the reinforcing of the other components of the programme: voluntary or negotiated agreements, national markets for tradable permits, regulations and incentives may be implemented to this end.

The purpose of the ecological tax was to support, via an economic incentive and a strong signal, all of the technical, regulatory, incentive and structural measures planned elsewhere in the programme. In an environment where the price of energy is high, the need to quickly implement a tax-based measure is not as strong, as the incentive to take action is already provided by the market. For this reason, in 2000, we saw greenhouse gas emissions generated by the Transport sector decline for the first time since the first oil crisis. This confirms, in the longer term, the value of such an ecological tax, which might result anyway from the work being carried out at the Community-wide level.

The various measures pertaining to this initial taxation project have been included in this national communication because, over the span of the programme as a whole, they have not been discarded. It is nonetheless appropriate to bear in mind the reservations expressed herein.

7.2 Reduced rate of VAT for Products and Services Contributing to the Fight Against Climate Change

RT-0.3 Reduced rate of VAT on Renovation of Existing Buildings

This measure is dealt with in the section on "Buildings".

Introduced in September 1999, the application of the reduced rate of VAT on improvement works in existing buildings falls under the Community-wide policy on the fight against unemployment. A list of services that are highly intensive in labour has been established by the Union and incorporated into the Directive on VAT as a temporary measure.

RT-7.3 Reduced rate of VAT: Energy-Saving Products and Services

E.2.6 Tax-Related Measures: Reduced rate of VAT

The possibility of developing a complement to existing measures on the application of reduced rate of VAT for the improvement of old buildings remains to be discussed with the Commission and the Member States. The measure would entail extending the already existing measure and giving this extension a very strong impetus toward energy savings and the fight against the greenhouse effect. More precisely, it would mean allowing the temporary or permanent application of the VAT at a reduced rate for all products and services that contribute to fighting against the greenhouse effect. Such a measure would cover materials with a high energy output in the fields of heating, lighting and household appliances.

With regard to the classification system introduced by the "Energy Label" (European Directive 92/75/CEE), certain household appliances in Category A may be eligible, as might certain high-output lighting appliances.

Services that offer assistance in decision-making and guidance might also be eligible, or even certain types of renovation that are not covered by the measures concerning work on existing buildings.

It should be noted that this measure would require that the Member States unanimously approve a modification of the Directive on VAT, and could constitute one of the lines along which the States elaborate a common policy in the fight against the greenhouse effect.

7.3 Energy Information Stands

PNAEE 1) a Energy Information Stands

The aim here is to create a local information network, made up of Energy Info Stands, targeting individuals, small companies and towns. ADEME has taken responsibility for manning the stands, which have been developed gradually, in partnership with local authorities, professional organisations and associations. 500 people will be recruited for this purpose.

7.4 Information Campaigns

PNAEE 1) b National Information Campaign on Energy Control

This undertaking will involve running a national information campaign, via the national and regional media, to make the French people aware of the need to modify their habits where energy consumption is concerned. Over EUR 5 million (FRF 32.8 million) will be set aside for this campaign.

EXISTING MEASURES

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
MANAGING ELECTRICITY DEMAND															
E-0.1	20	Nuclear Investments	Energy substitution	CO_2	Investment decisions on EDF's part	In force	EDF		46	46	46	46	46	Energy	
E-0.2.1	21	Development of Co-generation	Energy substitution, with a target of 4 GW in 2010	CO_2	Mandatory purchase of electricity produced through co-generation	Underway	EDF		5,8		3,7		4,4	Energy	
E-0.3	22	Reduction of Peaks on Load Curve	Energy substitution, CED, by broadening the scope of the Tempo rate and using an ADEME-EDF agreement	CO_2	Pricing, public incentives and pricing	Underway 30,000 Tempo subscriptions recorded in 1996, EDF/ADEME agree-ments dated 1993 and 1996	Ademe, EDF		1,3		1,8 à 2,9			Energy	
E-0.5 E-0.6	24	Reduction of the Negative Effects of the Standardisation of Electricity Rates	Energy substitution, CED in Corsica, in the overseas departments and territories and in certain rural areas	CO_2	Government aid	Underway	EDF		0,04					Energy	FRF 100 M/year under the FACC
E-1.1	32	Leakage from Natural Gas Grids	Reduction of fugitive methane emissions	CH_4	Investment decisions on the part of GDF	Underway	GDF	0,34	0,43	0,54	0,64	0,64	0,64	Energy	
E-0.2.2 E-4.1	26	Development of Wind Energy	Energy substitution (EOLE 2005 programme)	CO_2	Regulation	Underway. Reinforced by the objectives of the PNLCC	Minefi				0,7			Energy	
A-0.2.3 RT-4.1.1 RT-4.1.2 E-4.2.1	27	Wood Energy	Energy substitution (wood energy plan and local development)	CO_2	Government grants, contracts with local authorities	In force	Map-METL		0,2	0,2	0,2	0,2	0,2	Energy	FRF 1 500 over 1995 and 1996
A-I.4 in part	28	Bio-based Fuels	Energy substitution by developing the production of agricultural biomass for energy-related purposes	CO_2	Government grants, tax regimes	In force	Map		1					Energy	
E-0.4	34	Increase in Incineration Capacity	Energy substitution	CO_2	Equipment, regulations	Achieved (1992 Law on Waste, which sets limits to dumping of non-reu-sable waste)	Mate							Energy	
BUILDINGS, HOUSING, SERVICES															
RT-0.1	1, 2	Thermal Regulation	Improvements in energy efficiency in buildings (also applies to new services buildings)	CO_2	Regulations	Decree adopted on 29 November 2000	METL		0	0,9	1,5		2,4	Construction	
RT-0.10	3	Display of Energy Consumption in Buildings	Reward improvements in energy efficiency in buildings	CO_2	Regulatory	Planned	METL							Construction	
RT-0.2 RT-0.5 RT-0.6 RT-0.7	4	Financial and Tax-Related Incentives for Work on Existing Buildings	Provide incentive for work that improves energy control, reduce IR, State grants for home improve-ment, ANAH and PALULOS grants (PNLCC, p. 103)	CO_2	Economic instruments	Adopted	METL, Minefi		1,5	2,2	3,7		6,6	Construction	FRF 2 500 million in 1992
RT-09 RT-3.1	5	Actions on State-owned Buildings	Improvements in energy efficiency	CO_2	Regulatory	Initiated			0,7	0,7	0,7		0,7	Construction	
A-2.4	7	Development of the Usage of Timber in Construction	Carbon storage outside of forests, reduction CO_2 fossil emissions	CO_2	Information, research and regulations	Initiated	Mate				2,6			Construction , Agriculture	

Policies and Measures

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
RT-0.3	NM	Reduced rate of VAT forImprovement of Old Buildings	Encourage home improvement; reduced rate of VAT on improvements of housing older than two years	CO_2	Fiscal	Inquiry into the DLF of 15 September 1999	Minefi							Construction	
RT-0.8	NM	Classification of District Heating Systems	Improve energy efficiency by requiring new housing to be connected to the heating grid	CO_2	Regulatory	Planned	METL, Minefi							Construction	
RT-0.11	NM	Improvement of Existing Housing. Institutional Actions Concerning Road Freight	Improve existing housing	CO_2	Economic	Underway	METL							Construction	
TRANSPORT															
T-0.2.1 T-3.2.2	11	Institutional Actions Concerning Road Freight	Establish the best competitive conditions for freight through regulations, inspections on driving time and sanctions. Profession-wide progress contract	CO_2	Regulation	Regulation voted in 1993	MTEL							Transport	
T-011 T-3.2.3	NM	Recovery of Fiscal Dues on Gasoil and Increase of Minimum Tax Levels on Fuel	Reduce the gap in taxing on gasoil and gas to meet the European average, and change tax measures on fuel at the European level	CO_2	Fiscal regime	Initiated	Minefi							Transport	
	10	Technical Arrangements Relating to Heavy-Goods Vehicles	Reduce specific emissions through technical inspections and mandatory reconditioning	CO_2	Technical regulation	Enforced	METL			1,5	1,5		1,8	Transport	
T-0.2.2 T-3.1.4 T-4.3	12	Development of Inter-Modal Freight Transport	Develop inter-modal transportation alternatives, by using grants and technical measures (financing provided by FITTVN)	CO_2	Combination	Underway	METL		1,3	2,6	3,3		5,9	Transport	
T-0.3.1 T-1.1.1 T-1.1.2	13	ACEA Agreement	Reduce emissions from individually-owned cars	CO_2	Voluntary agreements	ACEA Agreement of 27 July 1998. Conclusions from the Council approving the agreement: 6 October 1998	European Commission, METL, Mate		0	5,1	10,3		17,2	Transport	
T-0.3.2	14	Technical Inspection of Light Vehicles	Reduce polluting emissions by making repairs mandatory	CO_2	Regulation	Decrees dated 5 July 1994 and 1 January 1995	METL		4,4	3,7	3,1		2,9	Transport	
	15	Renewal of Vehicles in Use	Bolstering renewal of cars in use by offering a government premium for retiring cars older than 10 years	CO_2	Economic	Measure in effect from 30 June 1995 to 31 December 1999 not renewed	METL							Transport	
T-0.3.3 T-1.4	17	Alternative Vehicles	Broaden use of alternative vehicles	CO_2	Law on Air, fiscal measures	Underway. Objectives far from being reached (in particular electric vehicle	METL				1,1		1,8	Transport	
T-0.1.6 T-3.1.1 T-3.1.2 T-4.2 T-4.4	18	Urban Transport	Optimise urban transport through the implementation of UTPs and local initiatives	CO_2	Law requiring local authorities to establish UTPs	Law on Air and Rational Use of Energy from 30 December 1996 – circulars dated 27/01 and 13/05/98 on UTPs	METL, local authorities				2,6		4	Transport	
T-0.3.6	19	High-Speed Trains	Offer an alternative to road and air transport	CO_2	Combination, including investment	Underway	METL, SNCF		0,4	0,5	0,6		0,8	Transport	
T-0.3.5	T2	Regional Express Transport	Improve conditions in daily travel	CO_2	Investment, infrastructures	Underway	METL, SNCF							Transport	

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
T-0.3.8		Limiting Speed in Lightweight Vehicles	Road safety and energy consumption	CO_2	Inspection and repression	In force	METL							Transport	
T-0.3.7		Reduction of Emissions Specific to Air Transport	Improving air travel in Europe	CO_2	Technical measures, invest-ments	In force	METL, Eurocontrol							Transport	
INDUSTRY															
I-0.2	8	Voluntary Commitments	Reduction in emissions	CO_2, fluorinated gases	Voluntary agreements	Five agreements have been signed (aluminium, steel, lime, cement and glass)	Mate		4,4	4,4	4,4	4,4	4,4	Industry	
I-0.1, I-0.3, I-1 RT-0.4	9	Supporting Measures	Energy efficiency. Grants from ADEME-FRAC, regulations on boilers, etc.	CO_2	Economic, fiscal, regulatory	All in force, compliance to be checked	Minefi, Ademe				0,4		0,7	Industry	
I-0.3	33	Regulation on N_20 Emissions from Industry	Reducing industrial emissions of N_2O	N_2O	Regulation	Decrees of 1 March 1993 and 2 February 1998	Préfectures		22,9	22,9	22,9	22,9	22,9	Industry	
I-0.4, I-4.2	23	Tax on Nitric Oxide Emissions	Pollution control	N_2O N_2O	Fiscal	In force – TGAP	Map							Industry	
AGRICULTURE AND FORESTRY															
A-0.1 A-1.2	34	Control Spreading of Nitrogen Fertilisers	Indirect reduction of N_2O emissions	CO_2	Regulation, information, increasing awareness	In force	Map		2,5					Agriculture	
A-0.2.1	25	Afforestation of Farmland	Expansion of carbon sinks (policy decision to timber 30,000 hectares of farmland per year)	CO_2	State Grants	No financing, objective reiterated by PNLCC	Mate		1,3		2,5		3,66	Forestry	FRF 65 million in 1995
WASTE															
E-0.4	29	Conversion of Waste into Energy	Energy substitutes (doubling the incineration capacity of OM)	CH_4	Legislative measure	Law on Waste dated 13 July 1992	Mate		1,3	1,3	1,3	1,3	1,3	Forestry	
DE-3	30	Ban on Dumping of Ordinary Waste	Reduction in CH_4 emissions	CH_4	Legislative measure	Law on Waste dated 13 July 1992, circular dated 28 April 1998	Mate		3,35		12,2		15,55	Waste	
DE-4	31	Recovery of Methane at Dump Sites	Reduction in CH_4 emissions		Regulatory measure	Decree dated 9 September 1997								Waste	

ADDITIONAL MEASURES

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
District Heating Systems are dealt within the "Buildings" section.					ENERGY PRODUCTION ELECTRICITY DEMANDE CONTROL										
E-1.2.1		Consumption in the Nuclear Fuel Cycle	Energy efficiency	CO_2	EDF investment decisions	Adopted	Minefi / Electricity Department								
E-1.2.2		Losses in Electricity Lines	Reduction in losses from electrical lines	CO_2	EDF investment decisions	Adopted	Minefi / Electricity Department								
E-2.1		Promotion of a European Regulation to Improve Electrical Appliances Intended for Public Sale	Changing European regulation	CO_2	Regulation	Initiated	Minefi / Serure				1,3			Construction	
E-2.2		Promotion of Energy-Efficient Appliances	Energy savings	CO_2	Information	Adopted	Ademe								
E-2.3		Specific Regulation on Electricity and Heating	Regulation in the field of lighting and pumps	CO_2	Regulation	Initiated	METL							Construction	
E-2.6		Reduced rate of VAT on Products and Services	Encourage renovations that slow the green-house effect in existing buildings	CO_2	Tax measures	Initiated	Minefi				0,9				
E-3		Substitutes for Traditional Heating	Replacement of fuel- and coal-powered electri-city plants with gas plants	CO_2	EDF Investments	Initiated	Minefi / Electricity Department				5				
E-4.1	26	Production of Wind Energy	Encourage the production of wind energy by establishing a minimum purchase price for electricity distributors (reinforcement of an existing measure)	CO_2	Regulation	Enforced	Minefi				2,6				
E-4.2.1	27 part	Production of Heat: Wood, Electric Heating and Tempo rate	Encourage the development of wood heating in lieu of electric heating in rural areas with sparse population	CO_2	EDF Pricing (Tempo)	Initiated	Minefi (et Ademe-METL)								
RT-4.1.1		Wood Energy for Collective Purposes, District Heating Systems	Continuation of the Wood Energy Plan, with an increase of 50,000 TOE in 2000	CO_2	Grants, tax measures	Applied	Ademe-Minefi				1,1			Construction	
RT-4.1.2		Wood Energy in Individual Housing	Actions on heating appliances and on fuel	CO_2	Information, grants, research, regulation	Initiated	Ademe-Minefi				0,3			Construction	
E-4.2.2	27 part	Production of Electricity Using Wood	Call for offers by EDF for the supply of electri-city from biomass, for a capacity of 10 MW, in order to allow the realisation of one or two experimental s	CO_2	R&D	Initiated	Ademe-Minefi								
E-6		Programme for Overseas Territories and Departments and Corsica	Replacement of diesel with renewable energy sources	CO_2	Government grants	Applied	Ademe				0,45				

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGETED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
The measures related to controlling energy demand are dealt with in the "Energy" section.		**BUILDINGS, RESIDENTIAL, SERVICE SECTOR**													
RT-1.1	1	Reinforcement of Regulation on Heating (Recent Buildings)	Reinforcement of regulation on heating adopted in 2000 (follow-up to RT-0.1)	CO_2	Regulation	Launched	METL				1.1				
RT-1.2		Technical Standards and Regulations on Components	Standards on windows with a view to reducing emissions	CO_2	Standardisation	Launched	Minefi-METL				0.85				
RT-1.3		Audit of Buildings in the Existing Services Market (for sale or for rent)	Development of tools to standardise measurements of energy consumption	CO_2	Regulatory requirement	Initiated	METL								
RT-1.4		Strengthening of Inspection Tools and Procedures	Improve enforcement of the regulation	CO_2	Regulation	Initiated	METL								
RT-2	7	Voluntary Agreements	Encourage action on the part of the construction industry (wood as material, windows)	CO_2	Voluntary agreements	Launched	METL								
RT-3.2		Actions on Pilot Sector Buildings	Partnership agreements	CO_2	Information	Applied	METL-Ademe								
RT-4.2		Solar Heat Energy	Develop the usage of solar heat energy within "continental" France. The three applications targeted are hot sanitary water for individual use, heating and hot sanitary water for collective use	CO_2	Grants	Applied	Ademe-Minefi				0.04				
RT-4.3		Geothermal Energy	Measures to encourage the use of geothermal energy	CO_2	Grants	Planned	Ademe-METL-Minefi				0.07				
RT-4.4		Heat Grids	Optimisation and extension of heat grids	CO_2	Grants	Applied	Ademe-METL-Minefi								
RT-5.1		The Rental Market	Allowance for energy efficiency in the evaluation of monthly rent	CO_2	Regulation	Planned	METL								
RT-5.2		Allocation of Heating Costs (condominiums and collective services)	Allowance for energy efficiency in the evaluation of expenses	CO_2	Regulation	Planned	METL-Ademe								
RT-6.1		Planned Initiatives for Improving Heating in Buildings	Operations requiring local impetus, as the main contractor will be the relevant town or group of towns	CO_2	Negotiated agreements	Launched	Ademe-METL								
RT-6.2		Conditions for Receiving Grants for Real Estate Purchase	Development of quality labels to condition grants	CO_2	Quality labels	Initiated	METL								
RT-6.3		Grant System for Services Buildings	Extension of existing grants for inhabitants to the services sector	CO_2	Grants	Planned	Ademe-METL								FRF 100 million/year
RT-6.4		Grants for Condensation Boilers for Collective Use	Subsidies for this type of boiler	CO_2	Grants	Initiated	Ademe-METL				0.14				FRF 20 million/ year
RT-6.5		Support for Quality Label Policy	Incentives for certain categories of contractors	CO_2	Grants	Initiated	METL-Ademe								FRF 145 M/ year
RT-7.2		Reduced rate of VAT on the Sale of Heat Produced by an ENR	Convince the European Commission to modify Annex H of the 6th Directive on VAT so that those connected to the heat grid and those who use heat from biomass benefit from a reduced rate of VAT of 5.5%, thereby improving the competitiveness of wood energy		Fiscal measures	Planned	Minefi								
RT-7.3		Reduced rate of VAT, Energy-Saving Products and Services	Extend already existing measure and give the extension a very strong impetus toward energy savings and the fight against the greenhouse effect	CO_2	Fiscal measures	Under consideration	Minefi								
RT-8.1		Quality Labels and Public Awareness	Covers the HPE label for new housing, but also the quality of products (for example, wood-burning heaters) and certification of workers	CO_2 HFC	Information	Initiated	Ademe-METL								
RT-8.2		Environmental Quality of Products for Construction	Training and information for workers	CO_2 HFC	Training	Initiated	METL								

4 Policies and Measures

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
RT-9		"High Environmental Quality" (HQE) Approach	Approach intended to integrate environmental concerns in rental contracts	CO_2 HFC	R&D	Enforced	Ademe-METL-CSTB								
B-2.1		Effects of the TGAP on Services		CO_2	Tax system	Suspended	Minefi				1.4				
B-2.2		Effects of the TGAP on Housing		CO_2	Tax system	Suspended	Minefi				2.2				
TRANSPORT															
T-1.1.1		Follow-up on Agreements and Future Reinforcement	Check actual compliance levels on ACEA Agreement in France	CO_2	Inspection	Proposed	METL-Mate								
T-1.1.2		Extension of Voluntary Agreements to Two-Wheeled and Lightweight Utility Vehicles	Reduce emissions in all vehicles covered	CO_2	Voluntary agreement	Launched	METL-Mate								
T-1.1.3		Incentives for the Replacement of Light-Weight Vehicles	Incentive to replace vehicles with more efficient vehicles	CO_2	Economic	Planned	METL-Minefi-Mate								
T-1.1.4		Other Incentive Measures to Replace Old Lightweight Vehicles	Labelling of vehicles, tax credit for "alternative" vehicles	CO_2	Economic	Proposed	METL-Minefi-Mate								
T-1.2		Alternatives to Air Conditioning and New Cycle	Limit the increase in CO_2 emissions from motors and the increase of HFC emissions resulting for air conditioning	CO_2	R&D, Regulation	Initiated	Mate-METL				0.2				
T-1.4		Electric and Alternative Vehicles	Drafting of governmental decisions on alternative "clean" vehicles	CO_2	R&D	Launched	Mate-METL-Minefi-Ademe				0.4				
T-1.5		Emissions Specific to Rail Transport	Increase the usage of electrically-run transport, replacement of Diesel engines, etc.	CO_2	Economic	Initiated	METL				0.4				
T-1.6		N20 Emissions From Catalytic Convertors	Improve understanding of these emissions and the means by which they can be reduced	N_2O	R&D	Planned	Mate-METL								
T-1.7		Speed Limits on Lightweight Vehicles	Speed limits integrated in newly constructed vehicles so that the difference between the speed they can reach and the maximum speed limit is not so significant	CO_2	Regulatory	Initiated	METL-Mate								
T-2.1.1		Monitoring of Speed in Heavy-Goods Vehicles	Reinforcement of speed checks at roadside and promotion of chronodactylograph use	CO_2	Regulatory	Launched	METL-Ministry of the Interieur-Ministry of Defense				0.8				
T-2.1.2		Technical Inspection of Heavy-Goods Vehicles at Roadside	Proper tuning of vehicles	CO_2	Regulatory	Launched									
T-2.1.3		Speed Limits on Lightweight Utility Vehicles	Study the feasibility and impact of a speed limit on lightweight utility vehicles	CO_2	R&D	Initiated	METL-Ministry of the Interieur - Defense								
T-2.2.1		Energy Consumption on Airport Platforms	Reduction in routing time through better signalling systems and improvements in allocation of energy	CO_2	Technical	Initiated	METL-Mate METL				0.2				
T-2.2.2		Improvement of Combined Usage of Air Transport and Public Transport	Improvements in public transport service to and from airports	CO_2	Economic	Initiated									
T-2.2.3		Pre- and Post- Conveyance by Rapid Train	Development of agreements between air and rail companies	CO_2	Negotiated agreements	Launched	METL								
T-2.3.1		Management of Large Inter-City Routes	Assessment of the various experiments to be carried out, in terms of CO_2	CO_2	R&D	Launched	METL				0.04				
T-2.3.2		Running of Traffic Lights and Progressive Signal Systems	Higher penalties for speed violations, leading to average reductions in speed of 10%	CO_2	Technical	Launched	METL				0.3				

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGE-TED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
T-2.3.3		Giving Priority to Mass Transport	Encourage the usage of collective transport, by increasing its speed and reducing its fuel consumption	CO_2	Economic	Launched	METL				0.07				
T-2.3.4		Regulation of High-Speed Urban Routes	Optimisation of speeds observed on high-speed urban routes	CO_2	Regulatory	Launched	METL				0.2				
T-2.3.5		User Information	Information systems and development of computerised tools	CO_2	Technical	Initiated	METL								
T-2.4		Facilitation of Coastal Traffic	Development of a mode of transport that consumes less energy than road transport, per tonne-kilometre transported	CO_2	Economic	Initiated	METL								
T-3.1.1		Controlling the Development of the Urban Environment	Definition of methods to help local authorities prioritise infrastructure projects, according to how much traffic they create and assistance in identifying problems	CO_2	R & D, Economic	Launched	METL-Mate (D4E)				1.5				
T-3.1.2		Urban Planning Documents and Localising Activities	Allowance for the impact on transport in these documents	CO_2	R & D, Planning	Launched	METL-Mate (D4E)								
T-3.1.3		Impact of the Waste Management System	Optimisation of routes and usage of the least polluting modes of transport	CO_2	R & D	Launched	METL-Mate (D4E)								
T-3.1.4		Integrated Transport and Grouping Loaders	Structuring demand for integrated transport	CO_2	R & D	Launched	METL-Ademe								
T-3.2.1		Taxation of Kerosene Oil	Implementation of a tax or fee system at the European level	CO_2, O_3	Tax System	Planned	METL-Minefi-Mate				0.4				
T-3.2.2		Compliance with Labour Rules in Road-Related Professions (follow-up to T-0.2.1)	Compliance with labour standards by these professions and European harmonisation in this field	CO_2	Regulation	Launched	METL				0.5				
T-3.2.3		Recovery of Tax Revenue from Gasoil (follow-up to T-0.1.1)	Gradually bring taxation on gasoil to the level of that on gas	CO_2	Tax System	Initiated	Minefi				2.7				
T-3.2.4		Tax system on Fuel in Public Transport	Extend partial reimbursement of the TIP on gasoil to public transport	CO_2	Tax System	Applied	Minefi-METL								
T-3.3.1		Internalisation of Cost of Carbon	Allowance for the cost of carbon in the TIPP	CO_2	Tax System	Initiated	METL-Minefi-Mate				3.7				
T-3.3.2		Control of Urban Travel (strengthening of T-0.1.5)	Continuation and extension of licenses on usage of road infrastructures	CO_2	Tax System	Blocked	METL								
T-4.1		Organisation of Community Territory	Allowance for emissions from transport in the SDEC	CO_2	Planning	Initiated	METL-Mate								
T-4.2		Inter-City Infrastructure Offering – Other Aspects	Measures within the framework of service schemes	CO_2	Planning	Initiated	METL				3.7				
T-4.3		Inter-Modal Facilities for Integrated Transport (follow-up to T-2.2)	Organisation of integrated transport	CO_2	Planning	Launched	METL-Ademe				0.7				
T-4.4		Public Transport and Alternative Urban Modes (follow-up to T-0.3.4)	Acceleration of programmes in this area	CO_2	Planning	Launched	METL-Ademe-Mate				0.55				
T-5.1		Training of Professional Drivers	Experiments enriching initial and continued training for drivers	CO_2	Education	Launched	METL								
T-5.2		Training for Driving License	Improving driver awareness about energy savings	CO_2	Education	Initiated	METL								
T-5.3		Corporate Responsibilities	Allowance for the greenhouse effect in corporate environmental plans and assessments	CO_2	Information	Launched	Ademe-METL								

4 Policies and Measures

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGETED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
INDUSTRY															
I-1.1	9 part	ADEME-FRAC Guidance in Decision-Making	Revival of incentives to limit emissions	All	Economic	Launched	Ademe				0.45				FRF 40 M/year
I-1.2	9 part	Research and Development FRF 20 million per year	Support for R&D on technologies and processes that contribute to lowering emissions levels	All	Economic , R & D	Proposed	Ademe-MENRT								FRF 20 million/ year
I-1.3	9 part	Technological Demonstrations FRF 30 million per year	Support for outstanding technological demonstrations	All	Economic , R & D	Proposed	Ademe-MENRT								FRF 30 million/year
I-1.4	9 part	New Methods of Financing	Foster ban financing for projects that limit emissions (FOGIME, FIDEME)	All	Economic	Launched	Ademe-Mate-Minefi								FRF 100 million/year
I-1.5	NM	Single Procedure for ADEME and FRAC	Improve the effectiveness of supporting measures	All	Organisation	Initiated	Ademe-Ministry for Industry								
I-2.1	33	N_2O : Reinforcement of ICPE Requirements	Additional reduction in industrial nitric oxide emissions	N_2O	Regulation	Launched	Mate				1.8				
I-2.2		PFCs (CF4) in the Production of Aluminium	Limitation of PFC emissions in the production of aluminium	PFC	Regulation	Initiated	Mate				1.8				
I-2.3		SF_6 and PFCs in the Electronics Industry	Measures specific to the electronics industry	SF_6 and PFC	Regulation	Initiated	Mate								
I-2.4		SF_6 in Magnesium Foundries	Measures specific to magnesium foundries	SF_6	Regulation	Launched	Mate								
I-2.5		SF_6 in Electrical Equipment	Relevant measures	SF_6	Negotiated agreement	Launched	Mate								
I-2.7		HFCs in Foams, Aerosols, etc.	Relevant measures	HFC	Regulation	Launched									
I-3		Tax on Energy (TGAP)		CO_2	Tax system	Suspended	Mate Mate -Minefi				7.3				
I.4.2		N_2O : Increase in TGAP	Additional reduction in industrial emissions of nitric oxide	N_2O	Tax system	Launched	Mate -Minefi				1				
I-5.1		Quality Labels and Standards	Changing industrial standards and practices to advance in the fight against the greenhouse effect	All	Information	Proposed	Industrie-Ademe								
I-5.2		Corporate Awareness	Changing industrial standards and practices to advance in the fight against the greenhouse effect	All	Information	Launched	Ademe								FRF 3 million in 2000
I-5.3		Training and Qualification	Development of energy audits in the industrial sector	All	Education	Launched	Ademe-Ministry for								
F-3.1		Strengthening of Inspection Requirements	Additional reductions in HFC emissions	HFC	Regulation	Proposed	Industry				0.7			Transport, Construction	
F-3.2		Inspection of Automobile Air Conditioning Equipment	Reductions in emissions of cooling gases resulting from automobile use	HFC	Education, Regulation	Launched	Mate				0.7			Transport, Construction	
F-3.3		Work towards Meeting Standards	Limiting leakage of refrigerant gases	HFC	Information	Initiated	Mate-METL				1.1			Transport, Construction	
F-3.4		Recovery of Fluids	Developing a channel for recovering used refrigerant fluids in the automobile industry	HFC	Economic	Launched	Mate				0.7			Transport, Construction	
F-3.5		Training and Qualification of Companies	Tightening of requirements for qualifying operators	HFC	Education	Initiated	Mate				0.6			Transport, Construction	
F-3.6		Study of Fiscal Measures	Encourage usage of substitutes	HFC	R & D	Initiated	Mate				1.4			Transport, Construction	
F-3.7		Research and Development	Improving understanding of emissions, equipment, possibility of moving toward other procedures and recovery methods	HFC	R & D	Launched	Mate-Minefi							Transport, Construction	

PNLCC #	2°CN or PNLCC #	NAME OF MEASURE	OBJECTIVE AND/OR ACTIVITY TARGETED	GHG TARGETED	TYPE OF INSTRUMENT	STATUS	IMPLEMENTING ENTITY	Mt CO_2 1995	Mt CO_2 2000	Mt CO_2 2005	Mt CO_2 2010	Mt CO_2 2015	Mt CO_2 2020	SECTORS AFFECTED	COST
The measures relating to the re-use of forest products for energy are dealt with in the "Energy" section. The measures relating to timber in construction are dealt with in the "Buildings" section.					**AGRICULTURE AND FORESTRY**										
A-1.1		CH_4 Emissions from Animal Breeding (and N_2O Emissions)	Preparations of recommendations by MAP to reduce these emissions	CH_4 N_2O	To be determined	Initiated	Map				0.9				
A-1.2	34	N_2O Emissions in Soil	Reduction of N_2O emissions from spreading of nitrated fertilisers	N_2O	Tax measures	Initiated	Map-Mate				1.3				
A-1.3		Integration of the Greenhouse Effect in Agricultural Policy	Inclusion of the greenhouse effect on MAP's part in elaborating the national programme on bovine breeding	Tous	Economic	Initiated	Map								
A-1.4		Actions to Improve Understanding	Reinforcement of research and development efforts, improvement in quality of statistics gathered	Tous	R&D		Map-Mate-MENRT								
A-2.1	25	Afforestation of Farmland	Incentives to timber 30,000 hectares of farmland per year	CO_2	Economic	Launched	Map				0.55				FRF 135M/year
A-2.2		Studies, Research and Experiments	Strengthening of research and development efforts in relevant areas	Tous	R&D	Initiated	Map-MENRT								
					WASTE										
DE-1		Control of Waste Production		CO_2, CH_4	Regulation	Launched									
DE-2	30	Reinforcing Recycling of Materials or Organic Matter		CO_2, CH_4	Regulation	Launched									
DE-3	29	Make Heat Recovery from Incinerators a Widespread Practice		CO_2	Regulation	Launched									
DE-4	31	Efficiency of Gas Capture Systems in Dumps		CH_4	Regulation	Launched									
DE-5		Biological Pre-Treatment as an Inhibitor during the Operating Period		CH_4	Regulation	Initiated									
DE-6		Analysis and Control of Biochemical Reactions in Dumps		CH_4	Regulation	Initiated									
DE-7		Agronomic Recycling of Organic Waste		CH_4, CO_2	Regulation	Launched									