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► To cite this version:

Sandrine Mathy. Urban and rural policies and the climate change issue: the French experience of governance. *Environmental Sciences*, 2007, 4 (3), pp.159 – 169. halshs-00366296

HAL Id: halshs-00366296

<https://shs.hal.science/halshs-00366296>

Submitted on 6 Mar 2009

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Urban and rural policies and the climate change issue: the French experience of governance

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Words: 5276

Abstract

This article describes and analyses each level of governance relevant to address climate mitigation within France. This refers either to climate policies or to measures adopted for other reasons but which impact on greenhouse gas (GHG) emissions. The first part describes the French context related to GHG emissions to emphasize the importance of taking into account local specificities when considering the determinants of GHG emissions. The second part analyses the framework of French governance relevant to climate mitigation at the national and at the local levels to emphasize tools at the disposal of local authorities to undertake mitigation actions. The last part describes and analyses actions undertaken in rural and urban areas to show the limits of the current articulation between the central state and decentralized levels of governance regarding climate issues and to propose improvements.

Keywords

National and local governance, France, climate policies, urban and rural areas, decentralisation

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1. Introduction

The French objective under the Kyoto Protocol is to stabilise greenhouse gas (GHG) emissions at the 1990 level during the period 2008-2012. Although this objective is weak¹ compared to other European Union (EU) countries, the projected emission levels in 2010 (excluding sinks) will be 7 to 10% higher than the 1990 level without additional measures to reduce or to modify energy consumption (CITEPA, 2005). Hence, the Factor 4² group³ report (de Boissieu et al., 2006) recommends further integration and implementation and encouragement of climate policies at local level to complement national policy.

This article analyses how responsibilities are shared between national policies and objectives related to climate mitigation, and local action, and the organisation of climate mitigation. It describes the French context and emphasizes the importance of taking into account local specificities when considering the determinants of GHG emissions. It then analyses the framework of French governance on climate mitigation at national and local levels to show the tools at the disposal of local authorities to undertake mitigation actions. The last section describes and analyses actions undertaken in rural and urban areas to show the limits of the current climate change governance framework and to propose improvements.

2. Climate mitigation in France: is the governance framework adapted to the context?

2.1. High growth of French GHG emissions from the diffuse sectors (transport and residential sectors)

The carbon intensity of the French GDP decreased by 17% during the period 1990-2003 (i.e. an annual decrease of 1.4%). 80% of the decrease was from energy efficiency and 14% from energy substitution. Half of the reductions occurred in the industry far beyond the reductions in the transport and residential sectors which have the largest GHG emission growth rates (See Figure 1).

INSERT FIGURE 1 HERE

Road transport of goods has increased by 34% in 2004 compared to 1990. This represents 80% of the total traffic due to the geographic situation of France, the important transit role (15% of the domestic goods transport) for a significant part of economic flows in Western Europe and the 75 million foreign tourists.

France is a highly urbanised country with 57 urban units of more than 100,000 inhabitants. Between 1990 and 1999, the urban population increased by 2.3 millions inhabitants, while rural populations decreased by 400,000 people. In urban suburbs where 12.3 million people live, the population has increased by 3 million in 25 years, while urban centres which were three times more populated have only received 2 million additional people. This trend goes with an evolution of the price index which induces more mobility needs. The building price index has multiplied by 8.2 between 1960 and 2002, while the price of fuel oils in constant Euros have decreased from 1.24 to 0.84. Hence people prefer to live far from urban centres where housing is expensive and to commute every day.

The French population has increased by 8% between 1990 and 2005 and it is getting older. The need for housing is increasing faster (+10.5% between 1990 and 1999) than justified by population increases (+3.7%) because of the rise in single occupancy households. Metropolitan France had 30.6 million homes in 2005, 2 million more than in 1999, the mean surface per housing has also increased from 80 m² in 1988 to 90 m² in 2002 and higher comfort standards and higher levels of equipment are also observed.

These factors explain the current growth in energy consumption and in GHG emissions in the residential and transport sectors which are not covered by the Emission Trading Scheme directive. In the following, the article analyses the framework of French action in climate mitigation and its performance.

2.2. Principal steps of the French climate policies

Although France has its own climate policy programmes, these are significantly influenced by the European Programme on Climate Change⁴ (EPCC1 in 2000, and EPCC2 since 2005).

2.2.1. The structural role of the European Commission

The EPCC is mainly composed of directives which fix a general framework, but leave Member States (MS) free to determine concrete modalities in their implementation. For example, the eco-design directive aims at the integration of ecological characteristics in the design of energy consuming equipment, but does not provide legally binding standards on specific products. These standards are subsequently determined by MS and the latter are authorized to validate any initiative of self-regulation adopted by firms, which will enable them to escape the eco-design rules.

Directives authorise MS to transpose its contents into their domestic law, and allow them to choose their preferred policy instruments. Consequently, EPCC directives may be transposed in diverse ways. For example, the Emissions Trading Scheme (ETS) directive leaves space for manoeuvre to MS in the control and the monitoring of the installations, and compared to the UK, the on-site control in France is nearly non-existent. Another element is the slowness of the transposition process which takes, on average, 15 months (as compared to 4 months in Finland) as observed by the French National Assembly (Philip, 2006).

2.2.2. National climate policies strongly influenced by lobbies

French programmes to address climate change fit into an inter-ministerial approach. In 2000, the French government adopted the first National Climate Action Plan - NCAP00 (MIES, 2000) followed in 2004 by a more ambitious NCAP - NCAP04 (MEDD, 2004). The plans use sectoral approaches and include about one hundred measures addressing seven GHG emitting sectors.

The process of elaborating measures within the NCAPs is managed by an inter-ministerial Agency (MIES-*Mission Interministerielle de l'effet de serre*) under the leadership of the prime minister. The process involves the participation of sectoral working groups of ministerial representatives, experts, economic stakeholders, NGOs, etc. The proposed plan is submitted to the government which has to arbitrate between requests from different ministries (mainly the ministry of economy and finance, the ministry of transport, the ministry of agriculture and ministry of industry). This often leads to a big gap between the proposed and the final plans, reflecting the influence of lobbies (car manufacturers, farmers' unions) and the predominant position of some important French exporting industries which have built the 'prestige' of the French industry (e.g. car manufacturing, nuclear energy).

After the official adoption of a NCAP, some measures may be *a posteriori* suppressed. The most significant example is the withdrawal of energy taxation which constituted 40% of the emission reduction objective of the NCAP00. This measure implied larger energy taxes on industrial intermediary consumption. Its content was first weakened by inter-ministerial arbitrage and by the parliament and was finally censured by the constitutional council after a case was submitted to the court by deputies and senators from the opposition. The bonus/penalty⁵ which was supposed to be applied to new vehicles was also suppressed. Other measures (like the doubling of the railway freight) were unrealistic. Finally, less than 10% of the measures contained initially in the plan were really applied (RAC-F, 2002). The remaining measures (promotion of biofuels, energy labelling, etc.) result from the transposition of EU directives and cannot be attributed to any political voluntarism.

When ambitious action to promote inter-modal substitution toward public transport in the transport sector is necessary, lobbying from vested interests often implies that the technology approach is favoured. Thus, 61% of the reduction objective in the transport sector in NCAP04 refers to the reduction of vehicular emissions through the development of biofuels or technical progress in motorization. Only 5.5% of the objective is related to spatial planning and national policies do not address the issue of urban sprawl. French transport policies favour road transport by launching or considering highway projects (the construction of more than 2500 km of highways is in process or is planned) while reducing subsidies for public transport in 2004. In 2006 funds dedicated to public transport covered only 30% of the financial needs.

Presented in 2006 as the core of government action in climate mitigation, the French biofuel plan has set more ambitious objective than the European objective. This plan promotes the flex-fuel, a mix of 85% of ethanol (made from wheat or beetroot) and 15% of gasoline. However, research shows the limited impact of this type of biofuel on fossil fuel consumption and GHG emissions (INRA, 2006). The promotion of the flex-fuel may instead ensure a new outlet for French farmers if the common agricultural policy has to be reformed.

Resulting from the influence of lobbies, the central state avoids imposing regulations or standards and favours incentives (tax credits, feed in tariffs or subsidies) and information (energy labelling, public awareness campaign) especially in the transport and residential sectors. In 1998, the European car manufacturers association concluded a voluntary agreement with the European Commission to ensure that new vehicles emit on average no more than 140gCO₂/km. The latest estimates (in 2004, vehicles sold in France emit on average 154gCO₂/km, only 2gCO₂ below the value in 2001) show that the objective will not be reached (Catania, 2005). Although a regulation on energy consumption per m² for new buildings exists since 1975, the real problem is the energy consumption in the existing building stock. Even when there is regulation, monitoring is insufficient, and estimates show that no more than 20% of new buildings meet the regulation.

A critical challenge is government inaction in implementing national objectives which have been set. Although the Energy Law⁶ (2005) defines new goals and sets targets for the decrease in energy intensity (2% annual decrease of the final intensity until 2015 and 2.5% until 2030) and in GHG emissions (a cut of 75 to 80% of GHG emissions in 2050, with an annual decrease of 3%), this overall objective has not been translated into sectoral targets or regional objectives, making this objective a pious hope.

Apart from measures in the NCAP, other measures for non climate change reasons have a positive (or negative impact) on emissions. In 2001, the annual license tag (vignette) for cars was abolished. This fiscal measure had introduced a symbolic but effective frontier between small-engine and big-engine cars, and had installed a virtuous circle between consumers' choice which took into account the implicit standards passed down by the State through the license tag and anticipation of this choice by car manufacturers. After the withdrawal of the license tag, the percentage of big-engine cars has increased significantly in France (Gusdorf and Hourcade, 2005). In contrast, the national programme related to road security (adopted without any consideration related to global change) had a positive impact on the diminution of speed and on oil consumption and explains partly (jointly with the high increase in oil price) the larger than expected decrease of GHG emissions observed in 2006.

French climate policies adopted at the national level are not ambitious enough, nor are they well monitored and enforced to reach the national overall objective of a factor 4 reduction by 2050. This brings us to the question: Are there opportunities at local level?

3. How to deal with climate mitigation at the local level?

Successive climate programmes on energy management have brought local issues in the forefront: the NCAP04 introduced the possibility for local authorities to undertake territorial climate plans (TCP) while the decentralisation trend observed during the last 35 years has transferred responsibilities to local levels

of governance in the domain of territorial and economic development. The result is that 15% of French GHG emissions can be directly attributed to local authorities (municipalities, inter-municipalities, agglomerations, departments, and regions), but it goes up to 25% if indirect effects of local authorities' choices related to housing, urbanism, transport and town planning are taken into account (ADEME, MIES, AFM, 2005), as local authorities consume energy with their fleet of vehicles, their buildings, and public lighting. They also offer services in transport, waste management or energy distribution (urban heating). They may also produce energy (e.g. renewable energy).

The French governance structure plays an important role. There are a large number of levels of public action: the State, the regions (26), the *départements* (100), i.e. a sub-regional administrative division, and the municipalities (36 560). In addition, there is the supranational level of action (European organizations), the inter-communal (a group of municipalities) level consisting of over 17,000 groupings including 2,525 public inter-communal cooperation bodies and 14,500 "*communes associations*". Vertically, there are thus six levels of administration in France and over 50,000 institutional actors.

The French system has one peculiar feature. It combines decentralised power in which the State transfers certain powers to elected sub-national governments and deconcentrated power where the State and its different ministries are present in the regions and the *départements*. In the latter, the State transfers certain powers exercised centrally by the central administrations (implementation of public policies, administrative decisions) to the sub-national levels.

3.1. Levels of administration and their shifting responsibilities

In the early 1980s, policy was essentially centralised. The decentralisation reform undertaken in 1982 was designed to reinforce local democracy and rationalise the administration. Thus, the central government allocated responsibilities to lower governments. In 1986, the regional councils were elected by direct universal suffrage.

Although this first stage of the decentralisation process gave a further boost to lower governments, the transfer of responsibilities was incomplete. Apart from the basic functions of the central government (e.g. justice, currency, etc.), none of the territorial responsibilities can be considered exclusive. The most recent decentralisation processes of 2002 and 2004 reinforced the transfer of power and responsibilities (to the departments, the regions and very marginally to the communes) and financial autonomy. The law now provides that taxes and other own-revenue sources must represent 'a determined portion of all resources'. Finally, the transfer of responsibilities from the central government must be accompanied by the allocation of equivalent resources for the expansion of responsibilities entails increased spending. Compared to recent decentralisation moves in Italy and Spain, the French reforms have not resulted in any institutional primacy for the region, and the devolution of responsibilities to the regions went only partially hand-in-hand with a boost to their budgets: the current revenues of French sub-national governments were supposed to rise by 13 % only compared to the significant transfer of responsibilities.

Economic development and territorial planning are essentially assigned to regions; different documents are elaborated by Regional Councils and by sub-regional authorities, focussing either on the negotiation of State-Region planning contracts (CPER) or on the region's medium-term economic strategy (SRDE) or on long-term spatial planning. CPER is a tool for public management by which the State and one region commit themselves jointly in the planning and the multi-annual financing of important projects. The contracts for the period 2002-2006 were supposed to integrate the climate change dimension, but only a few among the 22 CPER actually did so: 66% of the financial allocation were dedicated to road transport compared to 18% to the railways and 16% to other transport. Only two regions allocated less than 50% of the CPER budget to road transport, and the Paris region is the only one to allocate significantly to public transport.

While the regions define strategies (regions have been endowed with no competence in the field of energy), municipalities and *départements* specialize in the management of public services. Social services fall

essentially to the *départements* and municipalities focus on local neighbourhood matters (urban traffic, primary schools, school transport, etc.). Major infrastructural projects (ports, airports) are assigned to the *départements* which until that time had a strong habit also to finance main road construction (except highways), while railways of regional interest are managed by regions.

Intercommunal structures (EPCI) focus on environmental protection at the local level. The incentive provisions (in terms of grants from central government and harmonisation of local tax revenues based on the business tax) have borne fruit, and the vast majority of municipalities are today part of intercommunal structures (EPCI). They are able to finance important investments and manage facilities.

3.2. The development of planning tools and of contracts: an opportunity for GHG mitigation

The rationale behind French urban policy today is to progress beyond merely renovating problem neighbourhoods and, using comprehensive development plans, to foster genuine social and urban development in the disadvantaged areas. In the past few years, France has seen an unprecedented revival in planning:

- Since the Law on Air (1992), towns with more than 100,000 inhabitants must provide an Urban Transportation Plan which may address GHGs (GART, 2006);
- The Local Urbanism Plan (PLU) is a non opposable document that presents municipality objectives related to sustainable development in suburbs, renovation actions and the protection of natural or urban areas. Several municipalities may jointly develop a PLU for greater coherence and better harmonisation of procedures.
- The SRU law (2000) provides new planning tools for use in urban and rural development projects. Examples include territorial coherence plans (*Schéma de cohérence territoriale*, or SCOT), which cover entire catchment areas.

The SCOT allows municipalities to share their equipment and to envisage architectural changes inducing less energy intensive lifestyles. This scheme promotes greater access to public transport services in new urbanization projects and integration of green areas, shops, equipment and housing (RAC-F, 2007) to limit the spreading of mono-functional zoning. However, it allows property developers' to act on their own, when one solution could be to designate areas as 'no-construction' areas as has happened in Munich (EEA, 2006).

With the 'agglomeration community' and the 'urban community', a more integrated vision of cities prevails. The 169 existing agglomeration or urban communities (representing more than 20 million inhabitants) ensures a better match between urban economic development areas and France's administrative boundaries. Several municipalities share functions to elaborate and run common urban development projects. Each municipality has to transfer some competences to the urban community: cultural, social and economic development, urban transport, social housing management, public services, environment (waste management, air pollution). The main financial resource of the agglomeration community is the professional tax (based on the location value of buildings). Other financial resources are the cleaning up licence fee and taxes on drinking water and waste collection. The importance of the competences transferred to urban communities calls for direct suffrage in community councils to reinforce local democracy.

Since 1999, the central government and local authorities may sign 'agglomeration' agreements⁷ to improve interdependence between city parts, gain tighter control over urban sprawl and promote better quality of life as well as to identify development priorities. These contracts could be a good opportunity to take into account GHG mitigation and adaptation to climate change.

3.3. The Territorial Climate Plan (TCP)

The NCAP04 introduced the possibility for lower governments to voluntarily develop climate policy. Agglomeration or urban communities are an appropriate level for undertaking a TCP. Agglomerations of Rennes, Chalon sur Saône with the European Programme Privileges and the World Wild Fund for Nature, and Grenoble were the first to elaborate a TCP. TCPs is the result of 35 years of decentralisation in France and may appear as a well suited planning tool to address mitigation at the local level.

In 2005, Paris decided to elaborate a TCP for the inner city (and not the suburbs). This limits the possible outcomes, as one of the main problems is GHG emissions from commuting as Paris is a transit area for many people.

The Bilan Carbone is the methodology developed by the French Environment and Energy Management Agency to calculate direct and indirect GHG emissions within a territory (including freight and passenger transport). Paris emits 10.9% of national GHG emissions while emitting 10.2% of the GDP. 55% of these emissions result from trips (aircraft, bus, and cars) of the 25 million tourists. Even if Paris is the city endowed with the best public transport network in the world, freight and local passenger transport represent 30% of GHG emissions. Energy consumption in buildings is the second most important source of emissions. Due to a higher standard of living and level of services, emissions per capita in Paris are 3.5tCeq, which is higher than the national mean level (2.2tCeq).

A participative methodology is used to guarantee that climate policies will depend upon the acceptance of stakeholders. It relies on conferences and debates and thematic working groups (WGs) (building, economic activities, passenger transportation, freight, adaptation, public awareness and education, cooperation, and non polluting purchases) involving citizen representatives, key territorial/local stakeholders, the Paris Council and administration. WGs prepare policy recommendations which have to fall within the city competence. The recommendations are synthesized in a 'white book' which was presented in January 2007 to the Council of Paris and should lead to an Action Plan in 2007.⁸

There may be a gap between recommendations in the White Book and the Action Plan which is a political document. The Paris Climate Plan process was launched by representatives of the green party in the city council, but in order to become effective, the majority of the city council has to approve it. The content of the Action Plan will depend upon the political will of the municipality and due to the temporal proximity of municipal elections, some measures within the action plan may be perceived as too radical. The political dimension appeared also in Grenoble which was the first agglomeration to present a finalized TCP: the initiative had been launched by the Local Energy Agency, but it took a long time before the municipality got involved. Without political acceptance and commitment to the TCP, not much can be achieved.

Another weakness of this approach is that it is impossible for TCPs to include many mitigation objectives, since such measures either require the voluntary commitment of specific actors, or can only be decided at the national level.

The transversal approach of TCPs can assure actions to be really coherent with urban development, but the challenge to curb emissions from diffuse sectors in urban areas would need methodological issues to be solved and TCPs to become mandatory in all agglomerations.

When urban mitigation may be addressed with improved forms of TCPs, what kind of mitigation actions may be adapted to rural areas?

4. Decentralisation of mitigation actions: case studies in rural areas

In this last part, we focus on mitigation and action in rural areas. The first case study is really interesting in the context of decentralisation and refers to the development of wind power. The second refers to mitigation in agriculture which is a particularly determining issue for a country which is the first cereal producer in Europe.

4.1. GHG mitigation actions in rural areas: the development of wind power electricity

Policies undertaken in wind power development are a good example of the opposition between central planning *vs.* decentralisation of decision-making.

In 2000, in order to respond to the directive related to the promotion of renewable energy source, the French government set up a feed-in tariff⁹ system inspired by the German example – i.e. targeted at wind parks under 12MW capacity; stable until the first 1500 MW then decreasing to avoid undue rents from technological progress. A major difference with the German system was the absence of priority access to the grid, so that the promise of fixed tariffs combined with the possible limitation on access triggered a race among developers to be served first. At this time, the method used to define where to build new wind power infrastructures refers to planning rules which means that the territory is analysed according to several criteria and maps are drawn for each of them (natural areas, zones of particular diversity, housing areas, etc.). Maps are then superimposed and the remaining empty zones are considered as the areas that could possibly welcome new infrastructure. It works in a top down manner, considering the whole to decide the destiny of the parts.

The following period until the end of 2005 was a period of institutional learning with regional schemes for wind power where development remained voluntary but actions were co-ordinated by regional and departmental administrations. The potential wind power capacity totalled 3616 MW. This represented a significant growth in the potential capacity (3546MW) but a low increase in the installed capacity (169MW) over the period.

In 2005, administration decisions concerning the authorization of new wind power development were transferred to the level of department prefects and municipalities by the new law. Municipalities propose development zones after studies of impact and public inquiries to the department Prefect for approval. But the central government keeps control over wind power development through internal administrative channels, as department prefects are part of the government and endowed with the final decisions on wind power development zones and permits. Municipalities receive a fiscal incentive to allow windmills in their territory through a tax (the professional tax) linked to electricity production on its territory and to incomes generated from the sale of electricity to the national operator Electricité de France.

The new policy builds an interface between planning and siting institutions, which can be referred to as ‘flexible decentralized planning’ (Nadai, 2007).

4.2. Domestic projects (offset projects): a good opportunity to reduce GHG emissions in agriculture

Unlike industrial and energy transformation sectors (representing less than 30% of French GHG emissions) which are covered by the European ETS, there is no carbon price signal in the transport, agriculture, building and waste sectors and for other GHGs. Domestic offset projects could potentially stimulate emission reductions in these sectors which represent the most rapid growth in emissions, by remunerating emission reductions. Domestic offsets are inspired by the Joint Implementation mechanism under the Kyoto Protocol and each investor has to show the additional emission reductions induced by his investments. Presently, similar projects exist in New Zealand, Australia, and Canada. In New Zealand and Australia the system includes only energy producers, a group which is covered in France by the European ETS directive, but in Canada this system concerns only industries.

In France, project based emissions trading can promote GHG mitigation in agriculture which represents 20% of emissions and beneficiaries may be agricultural cooperatives, groups of farmers or large groups in the food-processing industry. Such projects include the installation of biomass boilers or reduction in the use of nitrogen fertilizers. Furthermore, as 640 000 French farms individually emit marginal quantities of GHGs, it is necessary to define a minimal size for agricultural projects to avoid high control and

management costs. The organisation of some branches of the agricultural sector such as the milk industry, or the beet industry, or more specific sectors may be quite relevant for domestic projects.

5. Conclusion

Even if the national mitigation objective Factor 4 is ambitious, there is no expression of this at the sectoral or at local levels. Because of the influence of lobbies, national policies refrain from imposing regulation which would be really needed in the transport or in the residential sectors. National policies only create incentives in the direction of specific actors, in specific sectors. This calls for a search for policy action at the local level.

The examination of the policy space at the local level is also relevant in the context of the decentralisation trend observed in France during the last years when many competences have been transferred to local authorities. Unfortunately, financial transfers have not followed this trend. This is also relevant for climate mitigation: with the creation of TCPs: the central government has chosen to decentralise the decision of implementing mitigation measures to local levels and so TCPs are based on a voluntary approach but no financial resources are given by the central state for local authorities to get involved in TCPs. There is a real need to reinforce this tool: it could become compulsory for big agglomerations, and impose a real objective of GHG emission reduction in order to make a link between national and local objectives.

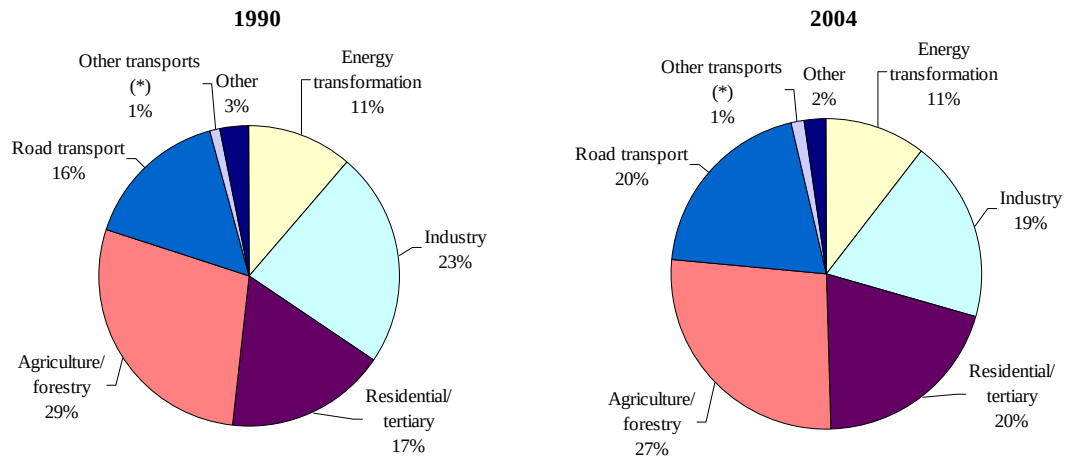
At the local level, apart from these incentives, some economic tools (domestic projects, feed in tariffs) are used to induce emission reductions related to specific activities, but they will not be effective enough to address ambitious emission reductions needed to reach the Factor 4 objective. There is a real need for the national objective to be translated into local objectives and to accompany this with financial resources needed to elaborate mitigation planning and implementation of measures not only limited to market instruments which will address mitigation at the margin in a specific sector, and which will be ineffective in addressing the problem of urban sprawl. An integrated approach is needed and local planning tools constitute a good framework for that.

6. References

- ADEME, MIES, AMF (Agence de l'environnement et de la maîtrise de l'énergie / Mission Interministérielle de l'Effet de Serre / Association des Maires de France). 2005. Un plan climat à l'échelle de mon territoire. November.
- de Boissieu C. et al. 2006. Rapport du Groupe de travail Division par quatre des émissions de gaz à effet de serre de la France à l'horizon 2050 . 77p.
- Catania S. 2005. Les véhicules particuliers en France, Paris, Ademe, 24p.
- CITEPA. 2005. Inventaire des émissions de gaz à effet de serre en France au titre de la Convention cadre des Nations Unies sur les Changements Climatiques - format CCNUCC. 362p.
- EEA (European Environmental Agency) 2006. Urban sprawl in Europe - The ignored challenge. ISBN: 92-9167-887-2
- GART (Groupement des Autorités Responsables de Transport) 2005. Les Plans de Déplacements Urbains - Bilan et perspectives. 42p.
- Gusdorf F., Hourcade J.C., 2005. Quelques leçons à tirer de la vie et de la mort d'un bel impôt : la vignette. Working Paper CIRED. 8p.
- Institut National de la Recherche Agronomique (INRA) 2006. Une nécessaire évaluation globale des biocarburants. Available from : http://www.inra.fr/presse/evaluation_des_biocarburants

- MEDD (Ministère de l'Ecologie et du Développement Durable) 2004. Plan Climat. 88p.
- MEDD (Ministère de l'Ecologie et du Développement Durable) 2006. 4ème communication nationale à la Convention cadre des Nations-Unies sur les changements climatiques. 227p.
- MIES (Mission Interministérielle sur l'Effet de Serre) 2000. Programme National de Lutte contre le changement climatique. 218p.
- Nadai A. 2007. 'Planning', 'Siting' and the local acceptance of wind power: some lessons from the French case. *Energy Policy*, 35(5):2715-2726.
- Philip C. 2006. Rapport d'information déposé par la Délégation de l'Assemblée nationale pour l'Union européenne sur la transposition des directives européennes. Paris. Assemblée nationale. 175 p.
Available from : [http://www.ladocumentationfrancaise.fr/rapports-publics/064000601/index \(...\)](http://www.ladocumentationfrancaise.fr/rapports-publics/064000601/index (...))
- RAC-F (Réseau Action Climat-France) 2002. PNLCC 2000-2003 : le gouvernement économise son énergie, Evaluation détaillée interassociative 2002 de la mise en œuvre du PNLCC. 64p.
- RAC-F (Réseau Action Climat-France) 2007. Transports et Changement Climatique - Manuel de recommandations à l'attention des acteurs territoriaux. Available from : <http://www.rac-f.org>

Figure 1: Comparison of sectoral contributions in GHG emissions between 1990 and 2004



Source: CITEPA, 2005.

¹ This results from the large part that nuclear energy has in the French energy mix which implies lower per capita emissions than the European average.

² “Factor 4” refers to a global long term objective of reducing emissions by 75% in 2050.

³ This group constituted by ministry representatives, economic stakeholders, NGOs, trade unions was in charge of elaborating measures required to reach a fourfold reduction of GHG emissions in 2050 (objective which is called in France the Factor 4 objective).

⁴ For a description, see Gupta et al. on a glocal problem requiring glocal action.

⁵ This consists of a subsidy (bonus) for cleaner vehicles, and a penalty (malus) on vehicles that have high emission levels. To be effective, the bonus and the penalty have to provide incentives/ disincentives.

⁶ Loi de Programmation et d’Orientation de la Politique Energétique – Energy Planning Law (July 13th, 2005), <http://www.legifrance.gouv.fr/WAspad/UnTexteDeJorf?numjo=ECOX0400059L>.

⁷ Out of 169 agglomerations eligible for these contracts, 94 had signed such contracts in 2005.

⁸ Paris is the only town in France to be at the same time a municipality and a department. The Council of Paris is the deliberative assembly of the town council and of the department council.

⁹ A feed-in tariff is a price guarantee for an energy producer over a specified period of time.