



## Strategies of European Automobile Manufacturers Facing Community Environmental Standards

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After 1973, when the issues of pollution and fuel consumption gained significance in the context of the petrol crisis, countries gave priority to reducing fuel consumption. This new context was particularly threatening for the automobile industry, which therefore welcomed initiatives coordinated by the European Community to improve the global competitiveness of the European industry by harmonizing national standards of vehicle safety and the reduction of fuel consumption and noise. If all the actors in the automobile sector agreed on the general principle of reducing consumption, they nevertheless showed interesting differences about ways of achieving that goal. The aim of this essay is to highlight the strategies of the various participants facing the complex issues involved in reducing pollution. Were interests different from one firm to another or was there a certain unity at the national level? Did European manufacturers propose a unified answer to environmental questions or, on the contrary, did they have so many different goals that each tried to impose its own views on European institutions? More generally, this essay raises the question of the respective weight of sectoral cultures, by definition transnational, national cultures, and institutional frameworks on the attitudes of economic actors.

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Among sources of pollution in industrial society, the automobile, because of its development, has played a considerable role in three areas: exhaust emissions, noise, and old, abandoned vehicles. In Europe, and particularly in France, this problem does not have the threatening dimensions that it has in the United States. Even leaving aside the special—and sometimes severe—problems of Los Angeles, it is estimated that in the United States the automobile accounts on average for 40% of atmospheric pollution. It is completely different in France: the rate of pollution for the center

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of Paris is usually measured at 25 or 30%, Paris being the only city to have employed instruments of measurement for several years.<sup>1</sup>

Automobile manufacturers often tried to counter alarming environmental observations by pointing out that it would be unjustified to extend measures based on the situation in Los Angeles outside American borders, or even throughout the United States, because the climatic conditions and smog levels in that city are unique. Nevertheless, most observers understood the importance of reducing pollution as quickly as possible.<sup>2</sup> The aim was simple: to reduce automobile exhaust emissions and noise pollution in coordination with public institutions, manufacturers, and petrol industry delegates through the creation of European environmental standards. European countries were ready to study these problems in close partnership and to unify regulations as far as possible. But because of the diverse—and sometimes competing—elements involved in this issue (energy, economics, public health) and because of the strong opinions and interests of those involved, agreement was not easy to reach. Moreover, we must not forget that at the beginning of the 1970s, those dealing with environmental issues in Europe had no local data relating to pollution. They could rely only on American studies. The very short period in which they had to make decisions did not allow them to await the results of European research on these questions.

At the beginning of the 1970s, cars were increasingly criticized because of the problems they brought with them, particularly in the cities—traffic jams, noise, air pollution. These concerns were the subject of numerous conferences at the time. Manufacturers tried to react to criticisms in the most convincing ways possible. From 1973, the issues of pollution and fuel consumption became intertwined in the context of the petrol crisis. The difficulties in obtaining petroleum and the rise in prices highlighted the necessity of using energy more rationally, and priority was given to reducing consumption. This new context was particularly threatening for the automobile industry, which felt that its activities were under scrutiny. More and more people felt that cars were going to disappear and give way to public transportation.

In France, for example, Louis Armand<sup>3</sup> was asked in December 1969 by First Minister Jacques Chaban-Delmas to prepare a summary

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<sup>1</sup> André Campana, “Lutte anti-pollution: réduction de 20% des émissions d’oxyde de carbone produites par les automobiles,” in *Le Figaro*, 4 June 1971.

<sup>2</sup> Environmental measures are not based on values as objective as safety measures, which can be referred to numbers of accidents and of persons injured or killed on the roads. Environmental measures deal with the connection, not always easy to establish clearly, between air pollution and possible consequences for health.

<sup>3</sup> An engineer, a former general director of the SNCF, and an academician since 1963, Louis Armand was one of the advocates of anti-pollution measures in France.

of nuisances (particularly air, water, and noise pollution). His recommendations were to be made public in March 1970. He concentrated his study on the automobile, which he considered “one of the most painful nuisances: it makes noise, it is polluting, it deals on physical and psychological levels with a real problem of modern society: the overcrowding of streets.” Armand wanted to promote not only electric cars, but also research on cleaner exhaust emissions (catalytic converters, for example), vehicles with accumulators and fuel cells, hybrid motors, gas turbines, and, more generally, technologies capable of long-term industrial development.

In the trans-national arena, the European Liaison Committee (Comité de Liaison de la Construction Automobile, CLCA) discussed environmental issues for the first time in June 1970. Being under general attack across Europe, European manufacturers tried to adopt a common strategy.

Clearly, the automobile industry had to make rapid changes. But policies to combat pollution could not be implemented overnight, and they had to take into consideration numerous dimensions. Technical data clearly had to be considered. It would be useless to adopt unrealistic standards beyond the capacities of technology, but equally ill-advised to fail to take account of new technologies. Economic aspects also had to be examined carefully. Price increases provoked by the implementation of anti-pollution measures might have severe repercussions on the automobile market, especially the sales of small cars. It was important that the standards proposed not endanger the lowest-priced cars, whose social role was essential. Planners also wanted to avoid measures that required technological innovations that could not be commercialized rapidly or that would endanger any national car industry through the application of ideas unacceptable to some producer countries. The evolution had to be progressive, and—as far as possible—concerted, at least on a European level.

Priorities had to be chosen carefully. Vehicle improvement can focus on performance, safety, or comfort, as well as on the prevention of various types of pollution. For economic reasons, all improvements could not be made simultaneously. Strong anti-pollution measures, for example, could delay the implementation of safety or comfort improvements; issues had to be prioritized and inserted into medium- or long-term policies.

Problems of automobile pollution cannot be taken out of context. The automobile sector is a “system” in which all the elements are interdependent: a reduction in carbon monoxide emissions, for example, almost inevitably provokes an increase in nitrogen oxide emissions; the use of catalytic converters requires the use of unleaded gasoline, which means a reduction in the octane rating, which implies a reduction in engine performance. Moreover, the automobile system is an open one, whose mutations can have external repercussions. For example, in France the tax system was based primarily on gasoline consumption and engine capacity, and that structure had been a prime determinant of the way

automobiles were designed. Such a tax system could find itself in contradiction with new solutions that called for catalytic converters and unleaded gasoline. Change would lead to important modifications in the structure of the automobile sector. Similarly, the petroleum industry would be directly concerned with the creation of unleaded gasoline; a significant reduction in the authorized lead rating would require huge new investments by petroleum companies and a change in the methods of producing gasoline.

### **Contradictory Interests Concerning the Definition of a Less Polluting Vehicle?**

Vehicles that meet new requirements—that is, those that are safer and less polluting—are more expensive to build, generating additional costs that manufacturers may, or may not, pass on to consumers. They are also more expensive to operate: it was generally assumed, for example, that the adoption of catalytic converters would result in a 15 percent increase in gasoline consumption.

Although the European Community (EC) recognized and affirmed several times the importance of a rational use of energy in transportation, by the beginning of the 1980s the transportation sector had contributed to neither energy conservation nor the reduction of petroleum dependence. In 1983, road transportation accounted for 85 percent of the sector's total energy consumption, compared to 3 percent for rail transportation, 2 percent for transport by sea, and 10 percent for air transport. Among seven member countries of the European Community (Belgium, Germany, Denmark, France, Italy, the Netherlands, and the United Kingdom), the transportation sector represented on average 4 percent of the gross domestic product in 1983 and was responsible for more than 4.5 million jobs. The total annual investment represented approximately 30 billion ECU. We can estimate that energy consumption in the transportation sector was split between 60 percent for people and 40 percent for goods. The UN's Economic Commission for Europe (ECE) reminds us that the transport sector played an essential role in the European economy and represented half the petroleum consumption of the European Community's twelve member countries, compared to a third in 1973. The total consumption of energy in the transport sector increased by 27 percent in 10 years, and the level of petroleum dependence remained practically the same (around 98 percent), while during the same period industrial consumption fell by 22 percent, and the petroleum dependence of the industrial sector was reduced from 43 to 26 percent.

Attempts to reduce exhaust emissions and to add to vehicle safety were usually in conflict with those aimed at the reduction of gasoline consumption. The additional equipment needed to reduce exhaust emissions (catalytic converters) as well as that required to improve impact resistance increases the weight of vehicles and, consequently, their fuel consumption.

### The United States: A Model to Follow?

There is no doubt that a growing number of nations were adopting stricter controls on exhaust emissions. Nevertheless, the process was very slow and subject to political as well as scientific considerations. In every highly industrialized country, the automobile industry was asked to reduce pollution and to improve safety. Manufacturers had to take into account public opinion and social concerns; this new perspective modified the automobile sector and for some manufacturers caused a marked change from their previous orientation. National states were and remained very important actors on environmental policy, but their prerogatives were increasingly transferred to international institutions.<sup>4</sup> France adopted ever more severe measures after 1963<sup>5</sup>; the German government initiated prescriptions concerning exhaust emissions at the beginning of the 1970s, and the Dutch government strengthened prescriptions against vehicle noise. In certain cases, especially when they did not reflect only specific domestic interests, discussions on the national scale formed the basis for European conversations.

The United Nations was still working on Regulation 15,<sup>6</sup> which since 1970 had constituted the basic document on maximum car exhaust emissions in Europe. This regulation, which was amended several times in order to adapt to advances in automobile technology and the imperatives of environmental protection,<sup>7</sup> was considered a satisfactory compromise,

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<sup>4</sup> Community laws take precedence over the legislation of member countries of the European Community.

<sup>5</sup> Decree no. 54-724 of 10 July 1954 already stated that “automobile vehicles are not allowed to give off fumes which could damage the circulation security or disturb the other users of the road.” In fact, a decree providing for the enforcement of a law was published only on 18 Nov. 1963 in the *Journal Officiel*: issued on 12 Nov. 1963, this decree is known as a decree on exhaust emissions, but it aims only at the opacity of fumes and not at their composition. It has no effect on the “harmfulness” of exhaust emissions. The first decree against pollution was issued on 28 July 1964. It limited starters’ gas emissions to 0.15% of the weight of consumed gasoline. Automobile manufacturers very easily obtained this result through the procedure of recycling crankcase gasses. The decree of 30 June 1970 maintained this standard—that is, 0.15% of gas given off by the crankcase, which represents the maximum percentage of the mass of the consumed gasoline; cf. “On soumet les prototypes à des essais rigoureux,” in *L’Usine nouvelle*, Sept. 1971.

<sup>6</sup> Regulation annexed to the Geneva agreement of 20 March 1958.

<sup>7</sup> The first regulation, in 1971, reduced carbon monoxide emissions by 40% and those of hydrocarbon by 36%. The second one, in 1975, reduced carbon monoxide emissions by 52% and hydrocarbon emissions by 45.6%. The third one, in 1977, took into consideration only nitrogen oxides, because it was considered necessary to implement a regulation in this area. It was important to fight carbon oxides, hydrocarbon, and nitrogen oxide simultaneously: attempts to reduce only carbon oxide and hydrocarbons can increase levels of nitrogen oxide.

because it responded to the need to reduce gasoline consumption as well as to measurably reduce carbon monoxide and hydrocarbon emissions. It was based primarily on the use of a poor blend of air and gasoline—that is, one inferior to an ideal chemical proportion. By 1985, the regulation limited the emissions of three of the principal pollutants: carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NO<sub>x</sub>).

Carbon monoxide is a harmful gas, its dangers well known. Hydrocarbons in exhaust emissions are produced from the components of gasoline that either do not burn at all or do not burn properly during the combustion in the engine. Nitrogen oxides are formed during combustion due to the presence of oxygen and nitrogen in air heated to high temperatures. Most of this pollutant consists of nitrogen oxide, a rather unstable product that transforms itself into nitrogen dioxide (NO<sub>2</sub>) through oxidation in the atmosphere. Under certain atmospheric conditions, nitrogen dioxide can contribute to the formation of ozone.

Regulation 15 of the United Nations was a document subject to intense bargaining.<sup>8</sup> In September 1979, discussions on the fourth revision of the provisions on atmospheric pollution were near the point of breaking down. Any agreement on emission standards by the UN in Geneva was dependent in practice on the common agreement of the countries of the European Economic Community (EEC) in Brussels. Although the United Kingdom was opposed to any reduction of the limit levels, it seemed as if an agreement could be found in Brussels on the basis of accepted industry data. But Italian manufacturers announced that they had obtained the written agreement of their Minister of Transport to block any strengthening of standards that would raise fuel consumption. Given the position of Italy and Britain, it was impossible to reach any agreement in Brussels. There was also a concern that Germany, which had reluctantly adopted the recommendations made by the industry and sustained by France, would try to act unilaterally. That situation carried great risks, and British and Italian manufacturers were encouraged to intervene in order to persuade the United Kingdom and Italy to rally around the compromise initially envisaged in Brussels. The Swiss announced that they would rescind their agreement to Regulation 15 and follow the American standards instead. The Swiss standard in 1982 was at the level of the U.S. standard of 1973, which was also the current Swedish regulation. The Swiss wanted to meet by 1986 the U.S. standard that was to be implemented in 1980. But the state of technology at that time would have

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In 1979, a fourth regulation reduced carbon oxide emissions by 61% and hydrocarbon and nitrogen oxide, jointly for the first time, by 35%. The fifth regulation, implemented in October 1984, reduced carbon oxides by 70% and the combination hydrocarbon/nitrogen oxide by 50%.

<sup>8</sup> “Pollution de l’air,” Mémento du Comité de direction de la chambre syndicale des constructeurs automobiles du 17 octobre 1979, Comité des Constructeurs Français d’Automobiles (CCFA) Archives, Paris.

required the use of unleaded gasoline. Switzerland, as a single nation, could not decide on its own to adopt a new kind of gasoline.

European directives were similar to the ECE prescriptions of the United Nations.<sup>9</sup> One of the main environmental directives, adopted on March 20, 1970, contained measures to reduce atmospheric pollution from emissions coming from gas engines. This directive deserves particular attention because it dealt with a broad spectrum—economics, public health, and the protection of nature. Individual countries were considering specific laws or proposals whose divergence would have produced real obstacles to the free circulation of motor vehicles. The prescriptions of the directive alleviated this danger, since member states had to conform to it. Between American and European methods of measurement, the Council, following the proposal of the European Commission, chose European ones after comparing cars' operating functions and the criteria used in the two measurement methods. The study led to the conclusion that European procedures were unquestionably more appropriate than American methods because of the very different European conditions. American operation represents the use of big cars on American road networks, both of which differ greatly from European conditions. The power/weight proportions of common European cars were much less than those of American cars and could not satisfy the conditions of acceleration imposed by the American conditions. American regulations considered a much more homogenous group of cars than the European one and aimed principally to eliminate unburned hydrocarbons, whereas European legislators concentrated on a struggle against carbon monoxide.<sup>10</sup>

The other important Community directive concerning automobiles and the environment is document 78/611/EEC, which defined the lead rating in gasoline.<sup>11</sup> The Bureau Européen des Unions de Consommateurs (BEUC) and the Bureau Européen de l'Environnement (BEE) believed that this directive was already insufficient when it was adopted. Since then, scientific research has shown that the levels chosen were indeed too high, especially for children and pregnant women. Moreover, the directive was

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<sup>9</sup> Verband der Automobilindustrie (VDA), Positionspapier der Automobilindustrie zum Thema Auto und Umwelt, July 1981, CCFA Archives.

<sup>10</sup> "Elimination des entraves techniques aux échanges dans le secteur automobile," Note d'information, Bruxelles, April 1970, Historical Archives Commission Brussels, BAC 3/1978, 1101.

<sup>11</sup> From 1 Jan. 1981 (implementation of the directive), the maximum level authorized of lead in gasoline was 0.40 g/l and the minimum was 0.15 g/l (Ireland got an exception for a maximum rate of 0.64 g/l for 5 years). Germany adopted the minimum level, 0.15 g/l (the same as Denmark). The United Kingdom also adopted the minimum rate of 0.15 g/l but to be effective only in 1985. Luxembourg, Belgium, France, the Netherlands, and Italy kept the maximum level allowed, 0.4 g/l.

unable to overcome the diversity of European national legislation. Therefore, in 1982, no uniform measure for all the EEC countries existed.

The European Community had been committed, since 1970, to reducing the pollution caused by motor vehicles. It had already made some recommendations whose aim was to reduce noise, gas substances, smoke, and particles, and the EC was preparing another proposition to introduce speed limits. Nevertheless, Community environmental concerns often were not immediately transferred into legal requirements. Until 1986, the directive concerning the noise provoked by engines was the only text to be implemented (in 1970). The directive concerning exhaust emissions and lead in gasoline, on which the Council had some difficulty reaching agreement, was not adopted formally because the Danish favored stricter standards. Nevertheless, other member countries adopted the directive, and automobile manufacturers prepared to produce engines that met the standards recommended by the European Commission. Although they represented a growing part of the European automobile industry, diesel vehicles remained outside the field of investigation.

Improvements were realized in environmental protection through reduction of noise levels as well as of exhaust emissions. In 1983, the emission of carbon monoxide per vehicle was reduced by one-third, and the emission of hydrocarbons was reduced by a half compared to the levels in 1969. Manufacturers also reduced noise levels by 3 decibels (dB) on average for new vehicles, which represented a considerable effort. The effects of these efforts would be noticeable, of course, only when newer vehicles began to replace those built before 1975.

In 1987, European projects were orientated toward stricter standards for CO, HC, and NO<sub>x</sub> emissions. But, unlike the UN Regulation, limits were established according to the power categories of vehicles. Three categories were used: engines of more than 2,000 cubic centimeters, those between 2,000 and 1,400 cubic centimeters, and those of less than 1,400 cubic centimeters. Only using electronic injection or three-way catalytic converters could theoretically satisfy community standards that were not defined for all categories. These dispositions seem to have received the agreement of all member countries.

### **Anti-Pollution Standards: The Different Dimensions**

The first movement toward lower gasoline consumption occurred in the United States.<sup>12</sup> American cars had always used powerful engines; before 1973, cars made in the United States had big V-8 engines with of a minimum size of 4 liters. Their low performance resulted in average gasoline consumption of 20 or 25 liters per 100 km. Anti-pollution

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<sup>12</sup> Committee of Common Market Automobile Manufacturers (CCMC), 2 Jan. 1985, "L'essence sans plomb et les normes d'émissions pour les automobiles," CCFA Archives.

standards in the United States were initially adopted when energy conservation was not a preoccupation. Afterward, when Americans began reducing fuel consumption and the power of their engines, they made reductions starting from these norms.

In spring 1966, the United States adopted the first standards in regard to atmospheric pollution, to be implemented by 1968. Then, on December 17, 1970, the Clean Air Act, sponsored by Senator Edmund Muskie of Maine, reinforced earlier measures (first in California, and then on a federal level) and envisioned a very sharp reduction of diverse pollutants from exhaust emissions by 1975-1976. In order to reach those standards, it was assumed that catalytic converters would be used by 1973-1974 to reduce carbon monoxide and hydrocarbons. In 1975, a second catalytic converter would be employed to reduce nitrogen oxide emissions. At the time, however, it was widely believed that internal combustion engines (even those equipped with “catalytic processors”) could not reach the standards defined for 1976. Manufacturers described the goals of the Clean Air Act as “prescriptions that no manufacturer in the world can meet.”<sup>13</sup>

In July 1974, the United States became the first country in the world to introduce legislation mandating lead-free gasoline, which would permit the use of catalytic converters for the purpose of emission control.<sup>14</sup> American manufacturers estimated that it would require 6 years to get clean vehicles on the market. American standards were so strict that an association was created in the United States composed of manufacturers (American manufacturers and importers) and petroleum industry delegates, who pooled their research funds. This association (Inter Industry Emission Control) undertook extensive laboratory research and testing in order to prove the quality of their joint efforts. Their research dealt with four different issues: heat reaction engines, catalytic reaction engines, double catalytic reaction engines, and a combination of the three systems. Only the first one could work with leaded gasoline. Without entering into details, we can estimate that the fourth solution, associating a heat reaction engine and a catalytic one (used with a system of recycling exhaust emissions) would cost approximately \$500—that is, about one-

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<sup>13</sup> Letter from Rodolfo Biscaretti, president of the Liaison Committee (Comité de Liaison de la Construction Automobile, CLCA), to Sicco Mansholt, president of the EEC Commission, s.d., Personal Documents of Paul Berliet, box 42, Marius Berliet Foundation, Lyon.

<sup>14</sup> Different kinds of catalytic converters exist: oxidation catalytic converters, which favor CO and HC oxidation, but are not efficient at all for NO<sub>x</sub>; reduction catalytic converters, whose first aim is to reduce nitrogen oxide, but their use is very limited; and the most important, three-way catalytic converters, which simultaneously reduce the three polluting gases but require a very strict control of the air/gasoline blend admitted in the engine. This control is realized by means of a sensor that controls the blend that goes to the engine and keeps it adjusted by means of a mini-computer.

third of the price of a medium-size car at the time. Gasoline consumption would be raised by 35 percent. Nevertheless, specialists believed that this was the only way to reach the American standards by 1976. Indeed, nobody seemed able to meet those standards immediately.<sup>15</sup>

An international association for dealing with pollution had been created in 1967, the AMA (Association of Manufacturers of Automobiles). Several French manufacturers (including Peugeot, Renault, and Simca), had participated in its work, which was to exchange data and share patents related to pollution. American manufacturers began to withdraw in 1969 because they felt membership was probably illegal under U.S. antitrust laws.<sup>16</sup> French manufacturers tried to renew this initiative on the European level, in particular in the framework of the Bureau Permanent International des Constructeurs d'Automobiles (BPICA), predecessor of the present-day OICA (Organisation Internationale des Constructeurs d'Automobiles) in collaboration with Working Party 29, the expert group on pollution and energy conservation of the UN's Economic Commission for Europe in Geneva.

Just as in the United States, the elaboration of anti-pollution standards was discussed in Europe at the Community and the national level. Without doubt, the European situation was less threatening than the American one: there were fewer and less powerful cars, smaller urban concentrations, and smoother climatic conditions. Nevertheless, increasing pollution levels called for new standards.

Even if environmentalists had advocated no regulations, manufacturers themselves would have tried to implement changes. Some of them were selling a lot of cars in the United States, and they therefore wanted to adapt their vehicles to American requirements. For all, the ability to meet American standards constituted a quality test, and they felt that neither price nor production issues should constitute an obstacle to the possibility of reaching the same quality standards for all vehicles as for those exported to the United States.

The regulation guidelines corresponded to the measures discussed in the United States: improvement of the internal combustion engine by better carburetion, a modification of its architecture, and recycling or post-combustion of gas, improvement of the gasoline by the elimination of lead or by the use of liquefied gas, and introduction of new engines, either electric (battery) or steam of fluids (in a closed circuit).

For historical reasons, European manufacturers developed engines different from those in the United States, and the results obtained were

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<sup>15</sup> Roger Jonquet, "La France n'imitera pas la rigueur américaine," *L'Equipe*, 4 June 1971.

<sup>16</sup> In February 1970, the association was condemned by the United States and American manufacturers had to quit the association they had created. Later on, they remained suspicious of any kind of revival of this association in the European framework.

better from the point of view of the optimization of performance and fuel consumption. The European industry developed small engines (average power: 1.5 liter) with a very high compression, burning gasoline with a high octane rating in order to maintain consumption at very low levels while satisfying the criteria of European traffic. Events since 1973 encouraged this way of energy saving. Because European engines have been so well optimized, changing one element would lead to a noticeable deterioration of performance.

European standards were not as strict as those in the United States, for a number of reasons relating to levels of pollution and the characteristics of vehicles and of the automobile sector in Europe. On both the national and EEC and OECD levels, European authorities did not want to burden the automobile industry any more than necessary in the world competition in which it was engaged.

The kinds of difficulties that could arise in trying to bring European standards into agreement are exemplified by the case of Sweden. The Swedish government decided to apply the new American standards concerning automobile air pollution by 1976. European manufacturers were very concerned about this decision, which would in the long term hinder their exports to Sweden. Therefore they expected an intervention of the European Community on the government of Stockholm.<sup>17</sup>

The Liaison Committee pointed out that a European regulation on this issue already existed, that defined in Geneva by the Economic Commission for Europe of the United Nations (Regulation 15), which was also incorporated in the Community directive of March 20, 1970. Meanwhile, the Working Party 29 also made another statement on this issue in its October session: they proposed a supplementary reduction in the limits recommended in Regulation 15, a reduction of 20 percent of the content by volume of carbon monoxide and of 15 percent of the mass of hydrocarbons.

For manufacturers of the Common Market, the decision taken by the Swedish government was problematic, because the American standards of 1973/1974 that Sweden wanted to meet by 1976 were more difficult to achieve than European standards, even if new prescriptions decided on in Geneva were taken into account. It must be remembered that comparisons are difficult because the tools of measurement were fundamentally different; but even more threatening was the willingness of the Swedish government to adopt the American system for vehicles (the so-called "American cycle," which refers to the energetic performance of the four-step process: blending of air and gasoline, compression, explosion, and exhaust) as well as U.S. methods of analysis and sampling.

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<sup>17</sup> Letter from Rodolfo Biscaretti, president of the Liaison Committee (CLCA), to Sico Mansholt, president of the EEC Commission, s.d., Personal Documents of Paul Berliet, box 42.

The Liaison Committee argued that the “American cycle” corresponded to traffic conditions in California, which were very different from the average traffic conditions in big European agglomerations. In its effort to be more rigorous, the Swedish government was putting aside European rules and conditions.

This orientation would be even more dangerous if Sweden decided to adopt new American prescriptions (such as those under the Clean Air Act), which were impossible for any manufacturer in the world to meet at that moment. The current attitude of Sweden led others to believe that the country did not want to stop at the mid-term levels for 1973/1974.

The attitude of the Swedish government was in conflict with studies conducted in EEC member countries and with the conclusions of the highest European institutions (the Economic Commission for Europe and the European Community). Their attitude was particularly surprising because air pollution in Sweden was not different from that in the rest of Europe and was far less problematic than that in California.

Moreover, Sweden had concluded a free-trade agreement with the European Community. This agreement had not yet been implemented, and Sweden already was instituting standards that would constitute technical obstacles to trade and might hinder any imports. Such an attitude endangered the hopes that trade liberalization and the creation of a large free-trade area had created.

### **The Definition of European Standards: The Case of Germany**

In December 1971, the Federal Republic of Germany was the only European country convinced of the necessity of a law to restrict lead in gasoline, but Switzerland and Sweden were close to sharing the same point of view. The use of catalytic converters eliminated almost all polluting emissions and therefore allowed a vehicle to meet even the strictest environmental standards. Nevertheless, this solution also had some disadvantages, emphasized especially by French and Italian manufacturers:

When using catalytic converters, fuel consumption raises by 5 or 6% and engine performance is reduced by around 10%. The technique of catalytic converters is not adapted to small cars, which constitute the majority of European vehicles. Vehicles will consume a lot of fuel and could also be very slow and perhaps not so pleasant to drive anymore. We could not avoid an increase in vehicles costs, between 4 and 22% according to the different models. The increase will affect in particular the most popular cars.

A reduction of car sales connected with price increases (both in buying and in using the car) is certain. This will contribute to weakening the situation of some European manufacturers, which are already facing serious financial difficulties. The European car industry as a whole has lost money

in 1982 and 1983. A first analysis lets us foresee a reduction of sales of new vehicles in the EEC by around 10%, i.e. 800,000 units with very serious repercussions on employment levels.

We must also expect unfavorable effects on the balance of trade due to the raise of brut petroleum imports, numerous purchases of spare parts from outside EEC, rare metals imports essentially from South Africa and the Soviet Union, and the rise of market share of non-EEC manufacturers in this market.

The additional cost for European cars is valued at approximately ECU 15 billion per year, taking into account the increase of vehicle prices and gasoline consumption and the maintenance of catalytic converters as required by the legislation. This estimate does not take into account repercussions on the balance of trade.<sup>18</sup>

The use of catalytic converters must also be accompanied by the exclusive use of unleaded gasoline. Despite all their concerns, European automobile industrialists accepted the elimination of lead in gasoline, even though doing so meant an octane reduction and therefore an increase in consumption.

We might think that this strategy emanated from German automobile industrialists. Indeed, most of the companies producing catalytic converters were German, so they had a technological advantage in this field. In March 1971, the firm Kali-Chemie in Hanover developed a catalytic converter made with a non-precious metal—to replace platinum—with which it was possible to satisfy American standards for exhaust emissions.

The American market represented the biggest export market for German manufacturers, in particular for Volkswagen, whose share in German exports was important and still growing at the end of the 1950s.<sup>19</sup> German manufacturers were already building vehicles that satisfied American standards. They would not have to invest in order to satisfy European norms, even if stricter standards were defined.

But it is clear that in fact the German government played the preponderant role on this issue; the German industrialists in the automobile sector were opposed to the adoption of stricter environmental standards.

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<sup>18</sup> CCMC, "L'essence sans plomb et les normes d'émissions pour les automobiles," 2 Jan. 1985, CCFA Archives.

<sup>19</sup> Germany, which exported a third of the cars produced in EEC member countries (quoted as "occidental" countries), in 1959 exported 50.7% of the cars it produced. Total amount: 870,957 vehicles, that is, 137,565 (or 18.8%) more than the previous year. In 1959 Volkswagen represented 46.4% (1958: 43%) of German exports. If we include minibuses and ambulances, Volkswagen's share of German exports reaches 51.6% (1958: 47.5%).

TABLE 1  
Volkswagen's Exports (Passenger and Light Utility Vehicles)

	1957	1959	1960	1961	1962	1963	1964	1965	1966
Europe	116,853	141,759	189,073	232,074	287,447	318,505	319,972	351,551	334,904
America	111,102	193,326	218,065	237,397	286,712	297,503	393,686	441,854	571,426
Australia/ Oceania	17,100	26,779	32,544	24,886	27,440	32,150	12,467	8,568	6,367
Africa	15,918	24,434	28,637	17,973	12,113	17,304	37,414	30,658	38,537
Asia	6,570	12,418	14,105	13,706	6,478	10,656	23,056	22,945	27,420
Indirect Exports	3,444	5,469	6,848	7,384	7,423	9,645	10,873	13,413	
Total	270,987	404,185	484,272	533,420	627,613	685,763	797,468	868,989	
%*	25	28	21	9	18	9	16		

\* Percentage of increase compared to the previous year

Source: *Annual Reports of Volkswagen AG*, Volkswagen Archives, Wolfsburg.

In September 1973, the press reported German, Dutch, and Danish projects whose aim was to encourage environmental policies through fiscal measures. According to the French professional organization (Comité des Constructeurs Français d'Automobiles, CCFA), these projects had little chance of implementation in Germany or the Netherlands, but in Denmark they might be implemented as early as winter 1973. In Germany, car manufacturers were firmly opposed to such initiatives because of their complexity and of the risk of a tax increase in the sector. When the president of the Bayerische Motoren Werke (BMW) Supervision Council suggested a "premium designed to favor the development of safe and clean cars" that would be distributed via tax reductions, the German professional organization (Verband der Automobilindustrie, VDA) indicated that this was a purely personal view that did not reflect the opinion of the organization as a whole. The inherent risk of such initiatives was that, by contagion, other countries would follow the same path, in particular by inciting their industries to go beyond the common regulations in certain fields like noise, safety, and pollution.

In June 1974, a VDA delegate declared that the German law on lead content in gasoline (reducing it from 0.4 to 0.15 g/l by January 1, 1976<sup>20</sup>) would provoke serious technical difficulties for the automobile industry. Gasoline consumption would be increased by 13 or 15 percent, and the new regulation would also have a negative influence on engine costs; the VDA therefore wanted to keep current standards. Despite the opposition of

<sup>20</sup> The European directive indicated a limit on exhaust emissions of around 0.4 g/l at this date.

industrialists, however, the measure was adopted and put into force in June 1976.<sup>21</sup>

In June 1977, the German government, and especially the Minister of the Interior, studied ways to reduce the negative impact of automobiles in urban environments. Research was oriented in a variety of directions: new road designs, adoption of maximum noise levels on highways, and cleaning up automobile exhaust emissions. Mercedes, BMW, Volkswagen, Opel, and Porsche gave to competent authorities eighteen car prototypes that promised reduced levels of pollution. According to an official poll taken in May 1977, consumers were ready to pay more (a sum equivalent to 1,000 French francs) to buy a vehicle better adapted to the environment.

In August 1981, Gerhart Baum asked German manufacturers<sup>22</sup> to reduce the exhaust emissions of 1978 by half by 1985/86. ECE regulation 15.4—which is the basis for Community directives—foresaw a reduction of only 20 percent before 1985. Manufacturers resisted measures sought by the government to tighten emission standards and cut fuel consumption.<sup>23</sup> They argued that the requested changes would add to the troubles they were already facing from falling sales at a time of recession and acute international competition.

The president of the VDA, Horst Backsmann, indicated that manufacturers had already worked on blend reducing and carburetion optimization. He made clear that no further improvements were possible from those steps. If catalytic converters were adopted, numerous secondary effects would be unavoidable: a rise in petroleum consumption, the use of unleaded gasoline, which was not yet on the market, an increase in automobile purchase prices and maintenance costs, and probably an increase in gasoline costs. There existed some catalytic converters resistant to leaded gasoline, but they were not very durable. Backsmann's attitude precisely reflected the position of the German automobile sector as a whole, which opposed the government's new willingness to reduce exhaust emissions. The industry classified its priorities as energy conservation, improvement of vehicle safety, reduction of vehicle noise, and reduction of exhaust emissions.<sup>24</sup>

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<sup>21</sup> Cars registered before 1 July 1969 had to pass regular controls against pollution, as was previously the case for more recent models.

<sup>22</sup> He invited Volkswagen, Daimler-Benz, Adam Opel, Ford, and BMW, as well as two of the biggest lorry and electrical equipment manufacturers, for an interview.

<sup>23</sup> In June 1981, Bonn proposed to its EEC partners that emissions standards be reduced by 50% from 1978 levels by 1985 and that fuel efficiency be increased by 15%.

<sup>24</sup> In order to avoid being misunderstood, manufacturers indicated that they considered each point as important and that they would do their best to make improvements in these various fields. But they did not want to work on reduction of exhaust emissions only to increase gasoline consumption. Since 1973 and the awareness of the alarming situation of petroleum dependence in their country,

Nevertheless, the industrialists themselves, without being obliged to do so through legislation,<sup>25</sup> agreed to reduce car exhaust emissions by 20 percent by 1985 (the level indicated by ECE 15.4) and to reduce by the same year the gasoline consumption of new vehicles by 15 percent (compared to 1978) instead of the 10 to 12 percent initially mandated by the regulation. They were also ready to conform to new standards of noise abatement determined by the German federal government.<sup>26</sup>

Having given in grudgingly, German automobile manufacturers viewed with astonishment the idea widely circulated in international committees that their position was in agreement with that of the government. They contested such an idea and tried to make known the wide divergences of points of view exist between government and industry in Germany.<sup>27</sup> The German government usually presented its proposals in international meetings as reflecting the German official point of view, even if the industry had not taken part in initial discussions. The manufacturers felt that the Ministry of Transports usually based its point of view on the automakers' experience and undertook a real dialogue before making a decision. But all ministers did not follow this process. Industrialists considered the Ministry of Environment (under the Federal Ministry of the Interior) as impossible to control. Although, according to the federal law on exhaust emissions, the Ministry of Transports had a shared authority on these issues with the Ministry of Environment, proposals made in common were usually more influenced by the points of view of the Ministry of Environment and consequently considered as "unrealistic" by industrialists. Such was the case, for example, with a document called "The Objectives of Exhaust Emissions for 1982,"<sup>28</sup> written in 1976 but immediately put aside by international institutions.

In April 1983, Gerhart Baum's successor, Friedrich Zimmermann, considered in his turn the possibility of a German initiative in the environmental field. Other European countries (except France) were willing to accept his plan to introduce unleaded gasoline into the country. Meanwhile, the British Minister for the Environment, Tom King, announced that by 1990 at the latest, each new car produced in the United Kingdom would run on unleaded gasoline. The German car and petroleum industries, while being in favor of these principles, criticized Bonn's unilateral decision on both technical and financial grounds. Daniel

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manufacturers developed new designs for vehicles that focused on limiting gasoline consumption.

<sup>25</sup> As we saw, directive 78/611/EEC concerning exhaust emissions and lead in gasoline was not formally adopted.

<sup>26</sup> These norms varied from 75 to 80 decibels according to the type of vehicles.

<sup>27</sup> "Positionspapier der Automobilindustrie zum Thema Auto und Umwelt," VDA, July 1981, CCFA Archives.

<sup>28</sup> "Zielwerte für die Abgase von Ottomotoren für 1982," Umweltbundesamt, 1976, CCFA Archives.

Goeudevert, the chairman and managing director of Ford Germany, declared that the added cost of a vehicle operating on unleaded gasoline would be particularly significant for low-income motorists looking for a small car at a reasonable price. The cost of a catalytic converter would not vary much according to the size of the car. Consequently, people buying small cars would have to pay more, in relative terms, than people buying powerful cars. Gerhard Prinz, chairman of Daimler-Benz, and Ferdinand Beickler, Opel's chairman, were suspicious about West Germany being the only European country to insist on lead-free gasoline. Prinz suggested that West German motorists might be trapped inside their own country if other nations did not also take the lead-free route. A Daimler-Benz representative described the introduction of unleaded gasoline as a "dead end," because it only increases gasoline consumption.

Worried about the effects of pollution on forests,<sup>29</sup> in July 1983 the German government decided to force the pace of the introduction of lead-free petrol in Europe for new vehicles by January 1, 1986.<sup>30</sup> It decided not to wait, possibly in vain, for all countries to agree on a uniform plan. Germany adopted a pioneer position in Europe: German standards from this point were almost identical to American standards.<sup>31</sup> With such measures, Germany hoped to obtain a 90 percent reduction of exhaust emissions emanating from vehicles. This measure severely frightened German industrialists. Given the fact that German automobile and petroleum industries had to impose on the domestic market both cars equipped with catalytic converters and unleaded gasoline, the two industries expected that the federal government would attempt during the negotiations in Brussels to secure a uniform regulation in the European Community.<sup>32</sup> In the automobile sector, there were EEC directives and ECE regulations concerning type-approval of vehicles. The automobile industry wanted an understanding that, if a national regulation were approved before a European one, cars corresponding to new requirements would, during the transition period, receive this type-approval just as did cars conforming to the EEC law or the ECE 15.4 regulation.

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<sup>29</sup> These strict measures were decided on after several assessments on the death of German forests, 33% were found to be damaged, primarily as a result of poison gases ejected into the atmosphere.

<sup>30</sup> It is unclear how the Cabinet Resolution was to be implemented in law. The EEC directive on exhaust emissions, which was valid in the Federal Republic of Germany, could not simply be discontinued; passenger cars that fulfilled its requirements must be allowed onto the roads. The invoking of Article 36 of the Treaty of Rome has little prospect of success, since an EEC Directive on exhaust emissions already existed.

<sup>31</sup> "Pollution automobile: la RFA adopte officiellement les normes américaines," in *Les Echos*, 27 Oct. 1983.

<sup>32</sup> VDA and MWV (Mineralölwirtschaftsverband, Association of the German Petroleum Industry), 2 Dec. 1983. Possibilities of adopting (for passenger cars) catalytic converters associated with lead-free gasoline.

The German government rapidly informed industrialists that it was open to negotiation. The government agreed to listen to experts (in particular, the manufacturers) and not to impose specific processes in order to reach a certain result—so, for example, manufacturers were free to meet the new standards while using a technology other than catalytic converters. The government emphasized its ability to use the tax tool, by raising the price of leaded gasoline sharply and reducing taxes on unleaded gasoline. Gerhard Prinz heard that the German government would be disposed to make complementary concessions, in particular to delay the introduction of new exhaust emission standards, initially scheduled for January 1986. The journal *Agefi* indicated that if this position were confirmed, one of the most acute conflicts between manufacturers and the government would be resolved.<sup>33</sup>

European observers noticed that the German unilateral measures corresponded to a tactical choice Germany was making on the European chessboard:

This measure aims at placing French and Italian manufacturers at a disadvantage. Instead of letting other countries impose new norms gradually, Germany preferred to go on ahead by encouraging technological innovation while leaving others to the old guard's struggles. They would protect investments, facilitate exports, and slow down imports—"kill three birds with one stone."<sup>34</sup>

Because, for political reasons, there was only a short period of time before the implementation of new pollution standards, the automobile industry considered as appropriate only the technical changes made by German manufacturers for models exported to the United States, which had to meet U.S. standards. Extreme values and measurement tools adopted in the United States were probably the only explanation, on a political basis, for the German government's position in terms of the environment. It is the reason why the petroleum industry, also following the American example, proposed introducing ordinary unleaded gasoline first.

Because Community law prevails over national laws, it was necessary to modify the directive against pollution implemented in the EEC for 1986. In this discussion, the automobile industry presented some conditions that could accompany the adoption of new limit values for EEC countries (including the use of catalytic converters).<sup>35</sup>

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<sup>33</sup> *Agefi*, 16 Sept. 1983.

<sup>34</sup> NDLR, "Pollution automobile: la RFA adopte officiellement les normes américaines," in *Les Echos*, 27 Oct. 1983.

<sup>35</sup> VDA, Introduction des convertisseurs catalytiques. Modifications nécessaires de la réglementation dans le cadre de la Communauté européenne (CEE, 3 Nov. 1983).

### The Basis of Discussions at the European Level

At the end of 1981 the Commission of the European Communities agreed that the possibilities for further reduction of permissible pollutant and noise emission levels should be investigated within the scope of an overall study of environmental protection, energy conservation, and safety.<sup>36</sup> Ad hoc committees dealing with the subjects of exhaust gases and noise emissions began their work in early 1982. The final report on exhaust emissions became available in mid-1983, while the "Noise Report" had already been completed by the middle of 1982. These reports were intended to give a sense of the technical possibilities for reduced emissions, together with resulting cost increases (in purchase price, operation, and fuel consumption). The European automotive industry actively participated in this work, while also undertaking its own investigations.

At the end of 1984, the European Commission put forth its proposals concerning unleaded gasoline and exhaust emissions of vehicles. Two steps were foreseen: by 1989/91, more restrictive exhaust emissions standards requiring an annual expense of ECU 7 billion and the installation of catalytic converters in 15 percent of new cars. It also proposed the progressive elimination of lead in gasoline: an octane rating of 85 MON (Motor Octane Number) as an inferior limit for "super" grade in Europe. By 1995, it wanted the adoption of more restrictive exhaust emissions that would require general use of catalytic converters in cars.

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Limit values: adoption US federal norms for CO/HC/NO<sub>x</sub> contents and insertion of these norms in Community directives (70/220/EEC) and ECE-R15.

Essay and measurement methods: application of the US procedure 75 Federal Test Procedure with driving cycle (Constant Volume Sampling) as indicated in directive 83/351/EEC or ECE R15.4.

Field of application: limited to automobile vehicles with positive-ignition engines, of a weight of less than 2.8 tons and which could carry five persons.

Type-approval process: according to the directive 83/351/EEC or ECE R15.4, the American type-approval certificate is recognized in the EEC for engine families that already had type-approval in the United States.

Transition periods: they are foreseen for vehicles which are fallen in the new field of application, but who are registered according to the directive 83/351/EEC before the implementation of the new directive.

Gasoline: the Community directive 78/611/EEC, which defined the lead content of gasoline, had to be completed by the introduction of ordinary gasoline and super for positive-ignition engines. We have to develop norms relating to unleaded gasoline (for positive-ignition engines) with minimum specifications. We have to convene provisory specifications before experimentations. We have to specify reference unleaded gasoline used for pollution measurement and, if necessary, for consumption measurement.

<sup>36</sup> EEC-ERGA: Evolution of Regulations in a Global Approach.

















