

EXPLAINING DIFFERENCES IN THE PERFORMANCE OF CLEAN AIR POLICIES: an international and interregional comparative study¹

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1. The concept

1.1 Basic questions

On the basis of a large international comparative study of implementation policies from 14 different regional implementation systems (RIS) from the Federal Republic of Germany,² United Kingdom,³ France,⁴ Italy⁵ and the Netherlands,⁶ we first tried to identify the impact of regional policies in terms of their capacity to influence the behaviour of individual emitters within selected local implementation areas (LIA). For each of the 14 regions we selected two to three LIAs with different structures of industrial and domestic SO₂ emitters. We aimed at having one of the three LIAs as a metropolitan area, the second one as a heavily industrialised area and the third one with a somehow mixed emitters structure.⁷ Within each of these local areas we tried to compare changes over time in the local ambient air quality ('immission' data in the field of sulphur dioxide — SO₂), relating these to the total amount of emission produced by local emitters. In a second step we tried to find out, by means of interviews conducted with the main emitters, the different motives behind observed changes in their behaviour.

One of the most striking results was that, as a whole and independently of the countries' national programmes, emitter behaviour was more decisively influenced by such factors as the production situations of companies, relative price differences on the fuel market, and energy saving measures undertaken by firms on their own initiative, than by specific public control measures. In the field of SO₂ pollution there is an inseparable relationship between production and emission volumes, and this is only marginally affected by environmental policy activities. Thus impacts of environmental quality policies in the field of air pollution control are much more limited than initially assumed.

As we will show in this contribution, there are, however, significant differences amongst our examined regions which nevertheless can be attributed to policy activities. Within this paper we would like to stress these differences in the performance of the regional policies although keeping in mind that even the most effective policy in our terms cannot completely explain the whole of changes in emitter behaviours. Politicians and agencies tend to considerably over-estimate the impact of their policies.

The common feature of the selected RISs relies on the overall responsibility of regional or local agencies for the control of the main emitters within their jurisdiction. There is only one exception to this which is the case of the two regions selected in Great Britain. Here the formal programme formation and implementation responsibility lies with the national Industrial Air Pollution Inspectorate (known at the time of the study as the Alkali Inspectorate). Nevertheless also in the case of this country we found significantly different interaction networks within the two selected metropolitan areas (South Yorkshire and Greater London). These differences justified the identification of at least informal RISs also in the case of Great Britain.

The most fascinating aspect of the comparison of the impacts of the selected regional policies was to identify different patterns of the distribution of regulatory activities amongst the examined LIAs. So we could find some regions within which regulatory activities were concentrated upon one single area whereas in areas equally or even more polluted regulatory activities were much more limited or even absent. Given these varying distributional patterns of scarce administrative resources we decided to concentrate our comparative impact evaluation also on this distributional aspect. Thus our dependent variable in the comparison of the regions became both a combination of the efforts and the relative intensity of regional regulatory activities as a whole as well as the different patterns of the distribution of regulatory activities amongst the different areas compared to what we called 'the problem pressure' (the extent of the exposed population together with the absolute immission levels). Our comparative question was therefore the following: which factors coming from inside or from outside of the RISs

TABLE 1

<i>Independent variables</i>		<i>Dependent variables</i>
national programme		overall activity level
political choices of regional implementation policies	regional regulatory activity	overall impacts
problem structure		impacts in highly polluted areas

affect, with what weight, the activity levels, the intensity and the distribution of regional regulatory activities? On the basis of our empirical data we could distinguish the following three complexes of independent variables: the national programme structure, the political choices of regional implementation policies, and the 'problem structure' (the actual region-wide distribution of the problem pressure). Table 1 shows the concept of the inter-RIS comparison.

1.2 *Possible characteristics of the dependent variables (performance level)*

As in the case of most international comparisons it does not make much sense to compare impacts in terms of absolute figures.⁸ It is evident that those figures might be the result of various country-specific factors which are of no interest for an international comparison. Therefore we produced, on the basis of all relevant data, statements concerning the overall regional policy performances. These statements take into account the following three dimensions:

The overall activity level: this level has been defined by comparing the number of all emitters of the region with the number of individual policy out-puts and/or the annual budget (personal, financial means etc) spent by the agency for the purposes of SO₂ control. Given the fact that with the exception of Germany our data do not indicate significant differences amongst the related averages of the involved countries, we could base our statements upon a national frame of reference. This country-specific frame of reference has been finally selected also for the case of the German RISs because on the one hand we could find a significant difference between the three regions (Nordrhein-Westfalen vs Bayern and Berlin) and because on the other hand the highly formalised German administrative procedures need more personnel than the more informal ones of the other countries involved.⁹ Furthermore we took into consideration the equity of the distribution of the outputs with regard to the distribution of the problem pressure within the region. A high overall activity level was attributed to those regions where the number of outputs and/or the agencies' budgets were relatively high (mainly compared to the other RISs of the same country) and where most or all of the problematic areas were affected by regulatory activities.

Overall impacts: this dimension was determined on the basis of our interviews with the main emitters in the local implementation areas. Again we took into consideration the spatial distribution of the impact: regions were only characterised as having high overall impacts where we could observe a relatively high impact of regulatory activities in all three selected LIAs. Again the main frame of reference consisted of the national context; this turned out to

be more reliable than the largely uncontrollable cross-national comparisons of simple facts stemming from very different regulatory traditions of the countries under comparison.

Impacts in highly polluted and densely populated areas: as already mentioned, we could find regions where in the most polluted metropolitan areas the impacts of regulatory activities were high whereas for instance in industrial pools we could only barely observe visible effects. Using this criterion we introduced a particularly immission-oriented evaluation dimension. This choice turned out to be necessary because of the predominantly immission-orientation of the national programmes of all of the included countries. According to this orientation clean air regulation is considered as a means to control local ambient air quality trends mainly in the surroundings of air pollution sources. The objective of such policies is in fact achieved whenever local concentrations of SO_2 (and not of H_2SO_4 eg) can be kept below a certain immission level. This policy concept only calls for a limitation of emissions when local air quality is affected. High chimney policies are therefore one of the most recognised and most visible consequences of these concepts. In the seventies no national programme of the included countries provided a systematic control of the total amount of the emissions of the country. We all know that from the point of view of the eighties (dying forests, trans-boundary air pollution, acid rain) an emission-orientation seems to be the only reasonable concept for an actually preventive air quality control policy. We are convinced, however, that any serious implementation evaluation of the policies of the seventies must take as its frame of reference the explicit policy intentions and not the point of view of the researcher. It is, nevertheless, also true that no national programme explicitly limited air quality regulations to highly polluted areas. Furthermore any immission-orientation by definition implies the mandate to observe and to control air quality trends in less urbanized rural areas ('non deterioration clauses'). Thus, even a successful concentration of regulatory activities on metropolitan areas, leaving apart the other areas, must be considered as a half way victory even under an immission-oriented policy concept. Therefore we had to take care of the already mentioned overall impact within the whole region.

By combining these three dimensions (1: overall activity level; 2: overall impact; 3: impact in highly polluted areas) we developed the following eight types of performance levels:

- 1: 1-, 2+, 3+
- 2: 1+, 2+, 3+
- 3: 1-, 2-, 3+

- 4: 1+, 2-, 3+
 5: 1-, 2+, 3-
 6: 1+, 2+, 3-
 7: 1-, 2-, 3-
 8: 1+, 2-, 3-

The proposed scale ranging from 1 to 8 corresponds with a decreasing performance level. This range takes account of the relation between costs and benefits, because the patterns with the even numbers reflect high activity and the odd numbers low activity, and administrative costs are a function of activity level.

- 1 *High effects with visible improvements in all areas of the region (including highly polluted areas)*
 low administrative costs: type 1
 high administrative costs: type 2
- 2 *Visible improvements in the highly polluted and densely populated areas within the region*
 low administrative costs: type 3
 high administrative costs: type 4
- 3 *Diffuse effects in all the region which, however, do not lead to significant improvement in the polluted areas*
 with low administrative costs: type 5
 with high administrative costs: type 6
- 4 *Regulation without any significant impacts*
 with high administrative costs: type 7
 with low administrative costs: type 8

1.3 *The independent variables*

Our results permitted us to reduce the complexity in the field of our three selected independent variables (programme structure, political choices of regional implementation policies, and problem structure) in the sense that we could in fact reduce them to two for each case: the mix of variables which turned out to mainly explain the differences between the selected RISs either consist of a combination between the variables 'political choices of regional implementation policies' and the specific 'programme structure' or between 'political choices of implementation policies' and the 'problem structure'. This reduction in the number of variables highlights the most significant elements of policy even if it may partly underestimate the weight of the eliminated variable. In this sense it must be remembered that even in the case of those regions where the national programme did not significantly shape the implementation

policies, the fact of its existence will undoubtedly have had a certain influence on the regional agencies.

The different variables can be characterised as follows:

The national programme structure: its explanatory capacity is high where most of the substantive, procedural and organisational elements of these programmes as well as their specific linkages are reflected within the regional policy. By definition this is only possible in the cases where national programmes contain relatively concrete elements (as in Federal Republic of Germany, Italy and the Netherlands).¹⁰

Problem structure: the explanatory capacity of this variable is high where the arrangements of outputs and their impacts can be interpreted as an immediate reflection of the problem pressure within the region. Both the spatial distribution and the intensity of regulatory activities in such cases can be mainly explained by the problem structure itself; the programme structure or specific political policy choices are of limited importance for the explanation of such policy effects. A good example is the case of the Paris region (Ile de France): here our data show that policy implementation activities are distributed almost in complete compliance with the trends showed by data as produced by the SO₂ measurement network. It must be stressed that this considerable correspondence is achieved due to the use of collective rather than individual outputs, committing a whole range of emitters within a certain area to emission reductions (special protection areas coupled with 'alarm networks' which automatically 'order' changes in fuels in critical periods).

Political choices of regional implementation agencies: if the implementation results neither reflect the observed problem-structure nor can be reasonably explained by specific priorities already set within the national programme, this third variable complex becomes important. We were in fact able to find regional policies where the main explanation was specific (mainly political) policy decisions, setting particular priorities for the region. These priorities not infrequently turned out to be even in opposition with the national programme and moreover inconsistent with the given problem pressure distribution. The main representative of this type could be found in those situations where the regional implementation policy seemed to be an immediate reflection of political pressure calling for or effectively preventing regional regulatory activities within the concerned localities.

Table 2 shows the different possibilities of combining characteristics of the selected independent variables:

TABLE 2

A: National programme	high	middle	low	
B: Political choices of regional implementation policies	high	middle	low	regional regulatory activities
B: Political choices of regional implementation policies	high	middle	low	
C: Problem structure	high	middle	low	

Before presenting the results of our study we should stress the fact that, against our initial hypothesis, one of the most frequently discussed¹¹ variables turned out to be of very limited importance: the degree of formalised access of the public to the policy implementation processes. We could not find significant differences in the contents of outputs between those countries which, by means of their procedural laws, guarantee a formalised participation of the public (the Federal Republic of Germany, France and the Netherlands) and those countries where the procedural arrangements must be characterised as relatively closed (Italy and Great Britain). The possibilities of influencing choices of regional implementation policies (against or in correspondence with the problem pressure) seem to depend much more on possibilities and capabilities of local governments to mobilise regional resources, or alternatively, to block the regional attempts to effectively control local emitters. This observation at least partly has to do with the fact that such policy decisions consist of general priority setting and planning decisions rather than individual clean up orders or permits. Formalised public participation is normally guaranteed within individual procedures.

Again, contrary to our initial assumption, the administrative and technical capacity of the regional agencies as such turned out to be of a very limited importance. Varying administrative capacities within one and the same country affected the activity and, more especially, the impact of the agency policies much less than we assumed. Such variations only lead to significant differences in the impacts when the corresponding interaction networks with local governments were equally developed. It seems that regional administrative and technical capacities can only be fruitfully used if interactions with local government are intensive and more or less in harmony.

2. The different performance levels of the 14 regional implementation systems

Table 3 shows the different performance levels (ranging from 1: high performance, to 8: low performance, according to the typology

TABLE 3

FRG	England	France	Italy	Netherlands
Berlin 7	London 2	Ile de France 1	Lombardie 2	Nord-Holland 3
Bayern 7	South Yorkshire 7	Nord-Pas de Calais 4	Emilia Romagna 6	Sud-Holland 4
NRW 8		Provence-Cote d'Azur 6	Piemont 7	Gelderland 7
Total	22	9	11	15
Average	7.3	4.5	3.7	5
Rank	5	2	1	4

TABLE 4

Group	Type	Regional Implementation Systems (: types)
1 high performance overall	1	2 London (2) Lombardie (2) Ile de France (1)
2 high performance in polluted areas within the region	3	4 Nord-Holland (3) Sud-Holland (4) Nord-Pas de Calais (4)
3 low performance	5	6 Emilia Romagna (6) Provence-Cote d'Azur (6)
4 without effects	7	8 Berlin (7) Bayern (7) Nordrhein-Westfalen (8) South Yorkshire (7) Gelderland (7) Piemont (7)

presented above) of the 14 regional implementation systems for the five countries included in our research. The ranking position is calculated by means of a simple addition of the positions of the individual regional systems indicated by the type-number we have attributed to these systems. The lower the total for a country, the better the country ranks in the comparison.

These results suggest the following comments:

With the exception of the Federal Republic of Germany (FRG) we can observe significant differences between the performance levels within one and the same country. On the other hand we can

find similar performance levels in a cross-national inter-regional comparison.

For several observers at least the two extreme positions will not be surprising: the first place of the French implementation systems will not surprise those scholars familiar with comparative policy analysis. Studies of other policy areas (industrial development,¹² telecommunications,¹³ public transport¹⁴) have indicated evidence of effective implementation, which is attributed to the high professionalisation of French policies ('les corps'), strong vertical interaction-networks amongst the individual policies, and the high 'technicity' of French policies with their concomitant 'campaign character'. On the other hand there are several reports which show the relatively low performance of German public policies (in the field of labour market policies¹⁵ or environmental policies¹⁶ as a whole). As in our case, this low performance has to do with the structure of national programmes.¹⁷ It is surprising that Italy is not ranked last; furthermore one of its three regions even ranks amongst the best performers. As we will see, this exceptional position of the region of Lombardy is due to the low degree of politicisation of its regional policy as well as to the relatively developed technical and managerial capacity of the regional agency.

Last, but not least, we must stress the fact that both our observations within the investigated regions and our comparative evaluative statements might be incomplete. Therefore the established ranking order for the included countries might be problematic and even dangerous. As we will show in the following, our research actually is much more interested in the cross-national regional comparison and especially in the attempt to compare the patterns of explanatory variables for different performance degrees than in the comparison of the countries as such.¹⁸

Table 4 ranges the 14 regional implementation systems according to the four main performance levels from 1 (= high performance) to 4 (= without significant effects).

It is interesting to notice that the three high performing regions come from three countries which are extremely different with regard to their general constitutional, political and economic conditions. The three regions, however, each represent one of the most important economic and political metropolitan areas of their respective country. The fact that two of the three Dutch regions ranked in the second class which, according to our typology, is characterised by a concentration on highly polluted areas, shows the still predominant immission-orientation of the Dutch clean air policy, in contrast to the official national government's declarations. According to official statements by the Dutch Government

and to central policy goals established in governmental air pollution abatement programmes, the main objectives are to prevent a deterioration of ambient air quality in general (non-deterioration clause) and to achieve a total national SO₂ emission load of no more than 500 kt/a.¹⁹ The same tendency also seems to be true for the Nord-Pas de Calais of France (the Ile de France is also a region where there is this strong immission-orientation; the reason it is in the first local group is that more or less the whole policy-relevant territory can be considered as a highly polluted and densely populated area). Four of the five countries are represented by at least one of their regions within the group of the mostly ineffective implementation policies. This last group contains six of the 14 regions. Furthermore it is interesting to notice that all three German regions are in this last group.

3. Cross-national comparison of the independent variables

3.1 *In high performing implementation systems*

Table 5 shows the explanatory capacity of the three independent variables for the three highest performing regional implementation systems:

TABLE 5

<i>Variables</i>	<i>London</i>	<i>Lombardy</i>	<i>Ile de France</i>
National programme	—	—	—
Political choices	middle	low	low
Problem structure	middle	high	high

This table tells its own tale: what strikes one is the almost complete absence of any significant role of the national programme for all three implementation policies in spite of their different structure. Both the British and the French programme, which are characterised by a very vague, incomplete (absence of concrete ambient air quality standards and general abatement equipment standards) and mainly organisational set of rules (eg the British Clean Air Acts) and the extremely detailed Italian programme (immission and emission standards etc) did not actually guide regional implementation activities. On the other hand, we observed in all three regions the explanatory importance of the dimension 'problem structure'. Regional implementation priorities as well as the content of individual outputs were significantly shaped by the actual pollution at the beginning of regulatory activities, by the observed pollution situation at the beginning of regulatory activities, by

the observed pollution trends within most of the local areas of the region and by the technical regulation requirements of the different groups of sources to be controlled. Correspondingly we found little evidence of explicit political policy choices concerning regulatory activities. In all three cases well staffed agencies seem to have succeeded in conceiving their regulatory activities in compliance with the varying problem pressure within the controlled areas. Notice that in all three agencies had to deal with political pressure coming from one or more local areas but were strong enough to use this pressure in order to identify problematic activities without becoming dependent on it. The agencies could maintain their independence by partly managing and dominating the network within which they had to act. One of the most important conditions for this success was the strong position of the agencies within this network but also their capability to use the pressure for their own purposes: namely the setting of priorities completely according to technically-perceived problem structures. One of our best examples is the policy of the Lombardian air pollution control agency (CRIAL) which explicitly set problem oriented priorities (extension of the monitoring network within the problematic areas of the province of Milan and concentration of regulatory activities upon emitters out of these areas following a schedule 'branche per branche'). These often had to be implemented by postponing individual municipalities' requests for further regulations. By this means the agency could achieve a relatively equal distribution of its regulatory resources which also took care of the pollution risk of those parts of the population living in municipalities, the political weight of which was not sufficient to mobilise regional interventions.²⁰

3.2 *In regions where high performance was present in high polluted areas*

Table 6 shows the explanatory capacity of the independent variables for those regional implementation policies which rank in the second group:

TABLE 6

<i>Variables</i>	<i>North-Holland</i>	<i>South-Holland</i>	<i>Nord-Pas de Calais</i>
National programme	middle	middle	—
Political choices	middle	high	high
Problem structure	—	—	low

The concentration on the most critical areas to the disadvantage of smaller industrial zones or rural areas seems to reflect, in all of the three regions, a corresponding political pressure articulated by the local

governments of the major urban areas. It becomes evident that the explanatory capacity of the problem structure is much more limited than for group 1. This becomes evident if one considers the increasing pollution trends outside the metropolitan areas which, according to the immission-oriented air pollution control concept laid down in the legislation of both France and the Netherlands would have called for further regional implementation activities. We can observe therefore a partial discrepancy between the distribution of the problem pressure and the distribution of the regulatory activities within the region. This group is particularly interesting for those scholars interested in distributive effects of regulatory policies.

3.3 *In low performing regions*

Table 7 shows the explanatory capacity of the two relatively low performing regional implementation systems, Emilia-Romagna and Provence-Cote d'Azur:

TABLE 7

<i>Variables</i>	<i>Emilia Romagna</i>	<i>Provence-Cote d'Azur</i>
National programme	—	—
Political choices	middle	middle
Problem structure	middle	middle

It is difficult to interpret this table. However, we can stress the fact that these two policies within the period of investigation have to be characterised as typical transitional policies. Within their countries they underwent a remarkable change from an immission-oriented towards an emission-oriented clean air policy. This change involved a concentration on a selected set of industrial activities within specific plants which were cleaned up independently of their location within or outside highly polluted metropolitan areas. The selection of these plants (Emilia Romagna: iron and steel works; Fos Etang de Berre Martigues within Provence-Cote d'Azur: new large-scale industrial plants) was influenced by political pressure working in both a positive and negative sense. This group is therefore interesting for those scholars mainly studying conditions for such a change in clean air policies. The increasing concern with the issue of acid rain, with its impact upon the forests of central and northern Europe, indicated a need for a change in policy emphasis of this kind, focusing attention upon emission rather than merely upon local ambient air quality (immission).

3.4 *In regions where implementation had no significant impact*

Table 8 shows the explanatory capacity of the independent variables of the six regional implementation systems which belong to the last group comprising implementation policies with almost no actual impacts.

TABLE 8

<i>Variables</i>	<i>Berlin</i>	<i>Bayern</i>	<i>NRW</i>	<i>South Yorkshire</i>	<i>Gelderland</i>	<i>Piemont</i>
National programme	high	middle	high	—	middle	low
Political choices	low	middle	middle	middle	low	high
Problem structure	—	—	—	high	—	—

This table shows in general the inverse picture of Table 5 above concerning the most performant systems. This is especially true as far as the low explanatory capacity of the variable 'problem structure' is concerned. The only exception is South Yorkshire. Here, compared to the RIS London, the influence of the problem structure must be rated high because regulatory activities have been decisively influenced by the specific problem situation (strong position of the coal mining industry, unfavourable economic situation). Thus, with a certain exception of the LIA Sheffield due to its rather effective Smoke Control Programme (domestic heating), industrial emission sources (and in the case of the LIA Barnsley also domestic sources) have been treated in a way which clearly reflects the prevailing problem structure (minor enforcement activities, especially concerning old industrial emission sources).²¹

Less significant but still evident is the high explanatory capacity of the programme structures. In the reports on regulatory activities in these regions we found many observations pointing out the constraining role of the national programme (for example legal clauses concerning the 'economic and technical feasibility' used by emitters as a successful weapon against regional agencies; or the legal provision that every emitter should be regulated (FRG); or the formal clean up procedure in the Italian legislation). Not infrequently we also found programme-related regulatory priorities which turned out to be far from the actual regulatory needs. Such priorities often led to inefficient outputs. In the case of the region of Piedmont the application of the national programme by the legalistic regional agency actually hampered the development of an adequate technical control rationality. This also held

true for the three German regions investigated. The German air pollution control programme as established by laws and regulations of the national and state governments is a highly complex one because almost every minor aspect of enforcement activities is covered by formal, very detailed regulations and directives to be observed by the responsible (implementation) authorities. Yet, on the other hand, the legal provisions have not led to the establishment of obligatory control requirements: there is a lack of clear and binding objectives as well as effective administrative instruments directed to the control of major emitting

TABLE 9
Level of performance

	<i>High performance</i>	<i>High in polluted areas</i>	<i>Low</i>	<i>Without effects</i>
National Programme				
— high				Berlin (7), Nord-rehein-Westfalen (8)
— middle		Nord-Holland (3), Sud-Holland (4)		Bayern (7), Gelderland (7)
— low				Piemont (7)
Political choices				
— high		Nord-Pas de Calais (4), Sud-Holland (4)		Piemont (7)
— middle	London (2)	Nord-Holland (3)	Emilia Romagna (6) Provence-Côte d'Azur (6)	Gelderland (7), NRW (7), South Yorkshire (7)
— low	Lombardie (2), Ile de France (1)			Berlin (7)
Problem structure				
— high	Lombardie (2), Ile de France (1)			South Yorkshire (7)
— middle	London (2)		Emilia Romagna (6) Provence-Côte d'Azur (6)	
— low		Nord-Pas de Calais (4)		

sources. Thus, to give just one example, the formal requirements have brought about rather sophisticated regional Clean Air Plans which were highly cost-intensive and required large numbers of staff. However, they soon turned out to be quite ineffective because the law did not provide for specific means to enforce these plans. Instead of eliminating this obvious shortcoming with the help of new, enforcement-oriented legal provisions, another development occurred: the tremendous increase in regulations with more detailed requirements concerning specific elements of the Clean Air Plans (eg emission inventory, monitoring requirements).

In general, the highly formalised German control system with its emphasis on secondary aspects and neglect of the core issues not only reduces the flexibility and latitude of the responsible authorities but also increases administrative costs and — owing to the limited budget — also swallows up resources badly needed for effective measures (eg supervision). All in all, the predominance of very detailed, formal regulations fits the political-administrative culture of this country and supports the attitude of public administration which is altogether in favour of legalistic approaches.²²

4 Conclusions: comparison of the explanatory patterns of the 14 regional implementation systems

Table 9 shows the influence of the three independent variables on the performance level of the regional implementation systems studied.

A highly programme-controlled clean air policy seems to have negatively influenced the performance level of regional implementation activities in the case of the Federal Republic of Germany but also, to a lesser extent, of Italy. In the latter case the relative success of the region of Lombardy has actually to be attributed to the fact that the regional implementation policy has been developed partly against the national programme. Highly programme-controlled clean air policies seem to be less problematic in the case of the two Dutch regions North-Holland and South-Holland (as well as in the case of two Swiss regional implementation²³ systems studied but not included in this report). On the contrary all three regions of the apparently 'optimal' case of France turned out to be much less programme-controlled than others.

One could argue that the extent to which public policies are programme-controlled is rather more dependent on the overall national political-administrative culture than on policy-specific features.²⁴ So we can find multiple public policies in the FRG as well as in Italy sharing the characteristic of being over-controlled by highly detailed programmes. This situation often hampers the development of adequate implementation policies on the regional and local level. Also, French

public policies often share common features: national programmes are often formulated in vague terms leaving a lot of discretion to regional or departmental implementation agencies which, in turn, are often both managerially and technically well staffed. Swiss and Dutch policies again seem to share relatively detailed programmes which anticipate a decision on those conflicts which in other countries normally arise only in the implementation phase. Therefore we can find more conflictual programme formation processes and less controversies in related implementation activities.

In spite of such cultural-specific explanations we can learn from our study that, independently of these political-administrative environments, clean air policies tend to be more successful if they leave to the regional implementation agencies a considerable leeway of political and administrative or technical discretion. This necessity stems from the nature of clean air policies themselves which have to control extremely different problem constellations. Furthermore such policies need a large consensus amongst local target groups which cannot be anticipated by detailed but still general national programmes.

Politically controlled regional implementation activities should not be automatically assumed to be low performers. Much depends on the position of the regional implementation agency within the regional policy network, and whether it is strong enough to countervail local political pressure likely to privilege selected areas to the disadvantage of others. However we also found politically controlled misallocation of implementation resources to the advantage of less polluted areas in the two regional implementation systems of Emilia Romagna and Provence-Cote d'Azur.²⁵

If combined with the characteristics of programme-controlled policies, explicit political regional implementation policies, however, seem to be condemned to ineffectiveness: in the case of the region of Piedmont the political control over the regional implementation policy was able to mobilise all elements of the national programme in a way which could check or even block regulatory activities, to the advantage of the most important emitters of the city of Turin.²⁶ Those agencies, however, which conceived their implementation policies mainly according to problem pressure data either by following a more technocratic concept (Ile de France and Provence-Cotes d'Azur) or a more participatory approach (intensive cooperation with local governments as in the case of the region of Lombardy) turned out to be most successful. In both cases implementation could profit from the absence of a significant deviating political control articulated through local governments' pressure as well as from the strong technical staff of the regional agency and its predominant role in the regional network. One should stress, however, that political pressure in the case of the region of Lombardy was not absent as such, but that the agency was successful in

canalising this pressure in a positive way. The same held true for the more informal regional implementation system of London, where both the Greater London Council and some local governments were able to mobilise political pressure in order to support locally (domestic heating control) and nationally (industrial air pollution control) determined policies.

5. Recommendations

On the basis of the results we have reported here in a very concentrated way, we have tried to formulate some recommendations for future modifications of clean air policies. These recommendations are presented in separate publications which did not only take care of comparative aspects but made an attempt to contribute further to different national policy debates according to the individual conditions of these countries.²⁷ Given the problem of long range air pollution, leading to the well known phenomenon of acid rains and dying forests, we recommended first of all a radical reorientation of the objectives of all policies. The recommended changes from immission towards emission-oriented clean air policies require drastic measures in the field of technological innovation concerning all combustion activities, independently of their location in more or less polluted areas. This reorientation concomitantly should lead to a certain shift of the burden of implementation within the regional agencies in the form of standardised national requirements for smaller plants as well as for large scale combustion facilities (such as power plants and different types of refineries). According to all our results it will still be important to limit these standards to a set of minimal requirements; regional agencies should have the possibility of fixing further technical conditions as well as branch-wide and/or locally different timetables for compliance. Given such guidelines for these to specific emitter groups, regional agencies will have resources enough to start clean-up activities in the large field of middle sized plants where at least in the immediate future they need considerable leeway of discretion. In order to exclude time consuming court suits about the extent of this discretionary power, parliamentary acts should explicitly clarify the legal leeway of regional implementation policies.

Given the fact that the French regional implementation systems turned out to be the most successful ones our recommendations are mainly based upon the following characteristics of these systems:

- a relatively subtle structure of the national programme, leaving important discretion to regional agencies;
- an adequate technical and managerial staffing of regional agencies;
- the capability of these agencies to defend their independent positions within the region-wide interaction network, as well as managerial

capacity to use local political pressure for the purpose of a problem-oriented setting of priorities;

- the existence of collective outputs oriented towards a whole group of emitters ('alarm networks' and 'special protection zones') the application of which is based upon contractual procedures including the main interest groups (local governments, industrial associations, regional agencies and environmental protection groups).

Nevertheless, we share the common scepticism with regard to any simple policy transfer proposition. As pointed out above, important elements of the French approach are rooted in the overall French political administrative culture and their transfer to another country risks failure because these conditions do not exist in the new country. Two illustrations of this are: the strongly organised 'corps' mainly responsible for French clean air policies, and the relatively low priority given to equity within the French political culture allowing, amongst others, a relatively high degree of flexibility in decisions on individual outputs.

It would be outside the scope of this presentation to discuss each of these recommendations. Nevertheless, we would like to emphasise that for the development of an internationally co-ordinated environmental policy national *and* regional features and preconditions of air pollution control policies must be given due consideration. As yet international policies have neglected the importance of regional aspects to an even greater extent than national policies. Especially when it comes to 'programming the programme', regional features—as we tried to demonstrate in this article—may have a great influence on the actual achievements of general pollution control programmes.²⁸

NOTES

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The national research teams were composed by Bruno Dente and Rudi Lewanski (Italy); Volker Prittowitz, Helmut Schreiber and Robert Brammer (Federal Republic of Germany); Michael Hill and Patricia Garrard (England);

Corinne Larrue, Richard Darbera and Henrique Magalhaes (France); Kenneth Hanf, Theo van der Tak and Theo Toonen (Netherlands).

Some early results of the study were published in English by the authors in *Policy and Politics*, Vol. 10 No. 1 (1982) p 85-109 'Formulation and Implementation of Air Quality Control Programs: Patterns of Interest Consideration' and in P. Downing, K. Hanf (eds) *International Comparisons in Implementing Pollution Laws*, Boston, The Hague, Dordrecht, Lancaster (Kluwer-Nijhoff) 1983, p 191-211, 'Implementing Air Quality Control Programs in Europe: Some Results of a Comparative Study'.

2. See Knoepfel and Weidner 'Die Durchsetzbarkeit planerischer Ziele auf dem Gebiet der Luftreinhaltung aus der Sicht der Politikwissenschaft. Ergebnisse aus einer internationalen Vergleichsuntersuchung', in *Zeitschrift für Umweltpolitik*, (Frankfurt), Nr 2, 1983, p 87-115; as well as the national report mentioned in note 1.
3. See M. Hill 'The Role of the British Alkali and Clean Air Inspectorate in Air Pollution Control', in P. Downing and K. Hanf (eds) op cit, 1983, p 87-106 and the British report mentioned in note 1.
4. See R. Darbera, C. Larrue and H. Magalhaes, *Politique nationale et mise en oeuvre du controle de la pollution atmospherique par le SO₂ en France*, Berlin (IUG rep 84-9), 1984; P. Knoepfel and C. Larrue 'Distribution spatiale et mise en oeuvre d'une politique publique: le cas de la pollution atmospherique', in *Politiques et Management Public*, No. 2/1985, p 43-69 and the French report mentioned in note 1.
5. See B. Dente and R. Lewanski 'Implementing Air Pollution Control in Italy: The Importance of the Political and Administrative Structure' in P. Downing and K. Hanf (eds) op cit, 1983, p 107-128; B. Dente, P. Knoepfel, R. Lewanski, S. Tozzi, S. Mannozi, *Il controllo dell'inquinamento atmosferico in Italia: analisi di una politica regolativa*, Roma (officina), 1984, and the Italian report mentioned in note 1.
6. See the Dutch report mentioned in note 1.
7. The study included the following Local Implementation Areas (LIAs): Italy: Bologna, Casalecchio di Reno, Piacenza (Emilia Romagna); Sesto San Giovanni, Villasanta, Cassano d'Addo (Lombardia); Turin (district Nr. 16), Chivasso, Moncalieri (Piemonte); France: Fos-Etang de Berre-Martigues, Marseille (Provence Cote d'Azur); Paris, Vitry, Creteil (Ile de France); Lille, Dunkerque (Nord Pas de Calais); Federal Republic of Germany: Berlin; Nurnberg, Munchen (Bayern); Koln, Duisburg (Nordrhein-Westfalen); England: Greenwich, Westminster, Brent (Greater London); Sheffield, Barnsley (South Yorkshire); The Netherlands: Ijmond, Amsterdam (North-Holland); Gelderland and Arnhem.
8. See L. Lundqvist *The Hare and the Tortoise: Clean Air Policies in the United States and Sweden*, University of Michigan Press, Ann Arbor, Michigan, 1980.
9. cf H. Weidner and P. Knoepfel, 'Innovation durch international vergleichende Politikanalyse. Dargestellt am Beispiel der Luftreinhaltungspolitik', in R. Mayntz (ed), *Implementation politischer Programme II. Ansätze zur Theoriebildung* (Opladen: Westdeutscher Verlag, 1983), pp 221-255.
10. See the more detailed analysis in: P. Knoepfel and H. Weidner: op cit 1983, p 91 and ff.
11. See Kunreuther H. and Linneroth J., *Risk Analysis and Decision Processes: The Siting of LEG Facilities in Four Countries*, IIASA, Laxenburg, Austria, March 1982.
12. See W. Neumann, H. Uterwedde 'Industriepolitik in Frankreich und der Bundesrepublik Deutschland', working paper, presented at the German-French Institute of Ludwigsburg (Germany), Dec. 1984; F. Jenny 'L'evaluation de politiques industrielles', in: Nioche, J. P. et Poinard (ed) *L'evaluation des*

- politiques publiques*, Paris (economica), 1984, p 187–204; C. Durand 'Les politiques industrielles de l'Etat', papier presente dans le cadre de la direction de la recherche du M.E.N. du C.N.R.S. dans l'action specifique sur 'politiques gouvernementales et entreprises publiques', le 9/10 mai 1985 a Lille.
13. See B. Jobert et E. Brenac: 'La contribution des entreprises publiques et l'elaboration des politiques gouvernementales: La D.G.T. et le plan cable,' papier presente a *L'Atelier Seminaire a Lille* (see note 12); J. Autin: *7 defis audiovisuels*, Paris (economica) 1984; Guillou B. 'Les strategies multimedias des groupes de communications', *La Documentation Francaise*, Paris 1984.
 14. See J. C. Thoenig, *L'Ere des technocrates. Le cas des Ponts et Chaussees*, Paris (Editions d'Organisation) 1973; C. Montrade 'Financement et politique de developement de la RATP: analyse historique et prospective de la dialectique: internalisation d'objectifs de la politique economique — adaptation a une demande evolutive', papier presente lors du Premier Congres du journal *Politiques et Management Public* (Seance 3–1) du 27 au 28 Sept 1984 a Paris.
 15. See F. W. Scharpf, 'Strategy Choice, Economic Feasibility and Institutional Constraints as Determinants of Full-Employment Policy During the Recession', in K. Gerlach, W. Peters, W. Sengenberger (eds): *Public Policies to Combat Unemployment in a Period of Economic Stagnation*, Frankfurt, New York (Campus), 1984, p 67–114; G. Schmid: 'Equal Opportunity Policy: A Comparative Perspective,' in *International Journal of Manpower*, Vol. 5 No. 3, 1984, p 15–25; F. W. Scharpf 'Economic and Institutional Constraints of Full-Employment Strategies: Sweden, Austria and Western Germany, 1973–1982', in: J. H. Goldthorpe (ed), *Order and Conflict in Contemporary Capitalism*, Oxford (Clarendon Press), 1984.
 16. See J. Hucke State and Local Relations on Environmental Regulations in the Federal Republic of Germany, in: P. Downing, K. Hanf, op cit, 1983, p 129–142.
 17. See: J. Feick, R. Mayntz et al *Regulative Politik und politisch-administrative Kultur. Ein Vergleich von fünf Landern und vier Interventionsprogrammen*, mimeo, Koln 1982, reported in J. Feick 'Internationale Vergleichbarkeit staatlicher Interventionsprogramme — Konzeptionelle und methodische Probleme', in R. Mayntz (Hrsg), *Implementation politischer Programme II, Ansätze zur Theoriebildung*, Opladen (Westdeutscher Verlag) 1983, p 197–220.
 18. See P. Knoepfel, C. Larrue, 'Les politiques publiques comparees: tourisme intelligent ou vrai progres? Le cas des politiques comparees de l'environnement', in *Politiques et Management Public*, Paris, Nr. 2, 1984, p 56ff.
 19. Cf. *SO₂-Beleidskaderplan*, Tweede Kamer, zitting 1979–1980, nrs. 1–2.
 20. See B. Dente, R. Lewanski, op cit, 1983 (note 5), p 123ff.
 21. See the British report mentioned in note 1.
 22. Cf. H. Weidner, 'Schwachstellen in der Luftreinhaltung. Die Bundesrepublik im internationalen Vergleich', *Umweltmagazin* No. 9, September 1983, pp 22–24.
 23. See: M. Peteis, 'Standard setting and implementation in SO₂-Air quality control policies', Fallstudien Schweiz, Zurich, (MS) 1982.
 24. See on this 'classical' question D. Ashford, 'The structural analysis of policy or institutions really do matter', in D. Ashford (ed), *Comparing Public Policies, New Concepts and Methods*, Beverley Hills, London (Sage), 1978, p 81–97. An interesting contrast: J. Feick, op cit, 1983 (note 16), 202ff.
 25. See the more detailed presentation in P. Knoepfel, 'Distributional Issues in Regulatory Policy Implementation: The Case of Air Quality Control Policies', in A. Schnaiberg, N. Watts, K. Zimmermann (eds), *Distributional Conflicts in Environmental-Resource-Policy*, 1986 (forthcoming).
 26. See B. Dente, R. Lewanski, op cit, 1983, p 115f.
 27. See the reports mentioned in notes 2 to 5.
 28. A striking example of the shortcomings of an international air pollution control

policy neglecting the basic national and regional features and their influence on implementational achievements is the EEC directive on ambient air quality standards for SO₂ and particulates of 1980. We have tried to draw attention to these shortcomings in an *ex ante* assessment shortly after the directive was enacted: H. Weidner and P. Knoepfel, 'Implementationschancen der EG-Richtlinie zur SO₂-Luftreinhaltepolitik. Ein kritischer Beitrag zur Internationalisierung von Umweltpolitik', *Zeitschrift für Umweltpolitik*, Vol 4, No. 1, March 1981, pp 27-67.



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