COMMISSION OF THE EUROPEAN COMMUNITIES

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COMMISSION REPORT

on the sector governed by Council Regulation (EEC) No 3528/86
of 17 November 1986 on the protection of the
Community's forests against atmospheric pollution

COMMISSION REPORT

on progress in the field covered by Council Regulation (EEC) No 3529/86
of 17 November 1986 on protection of the
Community's forests against fire

IMPLEMENTATION OF REGULATION 3528/86

CONTENTS

INTRODUCTION

Council Regulation (EEC) No 3528/86 of 17 November 1986 (1) on the protection of the Community's forests against atmospheric pollution entered into force on 1 January 1987. The cost of implementing the Regulation for a duration of five years was estimated by the Council at ECU 10 million.

The main measures provided for in the Regulation are :

- the establishment, at Community level, of a periodic inventory of damage caused to forests, based on a common network of observation points (Article 2);
- the drawing up by Member States of periodic forest health reports for transmission to the Commission (Article 3);
- the carrying out of pilot projects, demonstration projects and experiments in the field to improve understanding of atmospheric pollution and its effects, improve methods of observing and measuring damage, and devise methods of restoring damaged forests (Article 4);
- the coordination and monitoring by the Commission of the above measures (Article 5);
- the setting up of a Committee on Forest Protection (Article 6).

The maximum Community contribution to the forest damage inventory (Article 2) and to project implementation (Article 4) was set at 30%. Projects to be carried out under the Regulation have to be submitted to the Commission before 1 November each year.

Regulation (EEC) No 3528/86 was recently amended by Council Regulation (EEC) No 1613/89 of 29 May 1989 (2).

Under the latter Regulation, the Community's maximum financial contribution to projects carried out pursuant to Articles 2 and 4 of Rgulation 3528/86 has been increased to 50 %. The total estimated expenditure needed to implement the Regulation has increased to 17 million ECU. The carrying out of pilot projects for the maintenance of damaged forests has been added to the list of measures to be encouraged by the Community. Under Regulation 1613/89, a programme has also been introduced for the synoptic processing of information on knowledge of atmospheric pollution in woodland and its effects;
Finally, the Committee on Forest Protection has been replaced by the Standing Forestry Committee set up by Council Decision 89/367/EEC of 29 May 1989. (3)

(1) O.J. No. L 326, 21.11.1986 p. 2
(2) O.J. No. L 165, 15.06.1989, p. 8
(3) O.J. No. L 165, 15.06.1989, p. 14

I : PERIODIC INVENTORY OF FOREST DAMAGE (Article 2)

Article 2 of the regulation aims to :

- establish, on the basis of common methods, a periodic inventory of damage caused to forests, in particular by atmospheric pollution;

- establish or extend, in a coordinated and harmonious way, the network of observation points required to draw up this inventory.

The detailed rules for carrying out the inventory are laid down in Commission Regulation (EEC) No 1696/87 of 10 June 1987 (1). The common methods for the inventory were established on the basis of the recommendations of the working group of the international cooperative programme for the evaluation of damage to forests (Geneva Convention on Long-Range Transboundary Air Pollution).

The aim of Community action is to establish a periodic inventory of the health of forests in EEC Member States by gathering representative data on the severity of damage to forests and to monitor the situation. The inventory, which involves assessing the extent of defoliation and leaf discoloration on sample trees, is based on a 16 km x 16 km grid covering the entire territory of the European Community.

I.1 CARRYING OUT OF THE INVENTORY

Work on installing the Community network of observation points began in 1987. During the first year, two thirds of the observation points were set up, corresponding to approximately 1 200 observation points and 26 000 sample trees. Data was obtained from most of the points, with the exception of those in Portugal.

The network was extended in 1988. Observation points still have to be set up in Sicily and Sardinia, as well as in the whole of western France. In 1988, 37607 trees at 1526 points came under observation.

(1) OJ No L 161, 22.6.1987

By 15 December, each Member State has to transmit to the Commission standardized information sheets containing the data gathered from the observation point network during the year; the data is then computer-processed at the Commission. However, the rules laid down in Regulation (EEC) No 1696/87 have not always been followed and sometimes the forms have not been filled in properly or have arrived at the Commission after the expiry of the deadline.

The results of the observations carried out throughout the network are presented in the report on the health of the Community forests for 1987/88.

I.2 APPLICATIONS FROM MEMBER STATES FOR FINANCIAL ASSISTANCE

Under Article 2 of Regulation 3528/86, Member States may submit to the Commission applications for financial assistance to install and extend the Community network of observation points described above and to carry out the inventory using these points as a basis.

I.2.1 PROJECTS SUBMITTED BY MEMBER STATES

During the first two years, 22 projects (11 in 1987 and 11 in 1988) were submitted to the Commission under Article 2.

The total cost of these projects amounted to ECU 3 863 495 (ECU 639 179 for 1987 and ECU 3 224 316 for 1988). The high figure for inventory projects in 1988 is largely due to an Italian project involving carrying out the forest damage inventory at national level using a 3 x 3 km grid. In calculating the Community's financial contribution, account was only taken of observation points forming part of the Community network.

The Community contribution requested (which is limited to 30% of the total cost of the project) was ECU 185 574 for 1987 and ECU 156 657 for 1988 (a total of ECU 342 231 for the two years).

Table 1 gives, by country, the number of projects, their total cost and the assistance requested for the two years. Figure 1 shows the levels of assistance requested in 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK	TOTAL
NUMBER OF PROJECTS	87		1	3		1	1	1	1		1	1	1	11
	88		1	2	1	1	1	1	1		1	1	1	11
	TOTAL		2	5	1	2	2	2	2		2	2	2	22
TOTAL COST	87		42685	58301		84166	10850	15032	114542		3529	95034	225040	639179
	88		8407	46687	40869	104548	115603	15497	2775461		3531	55096	47617	3224316
	TOTAL 2 YEARS		51092	104988	40869	188714	126453	30529	2890003		7060	151130	272657	3863495
AID REQUESTED	87		3816	17489		25250	3255	7319	34362		1061	75510	67517	185574
	88		2522	14005	12260	31357	34680	4649	22016		1059	19828	14285	156657
	TOTAL 2 YEARS		6338	31494	12260	56603	37935	11968	56378		2120	45339	81797	342231

Table 1: Number of projects, total cost and AID requested for 1987 and 1988 (Article 2 of Regulation 3528/86)

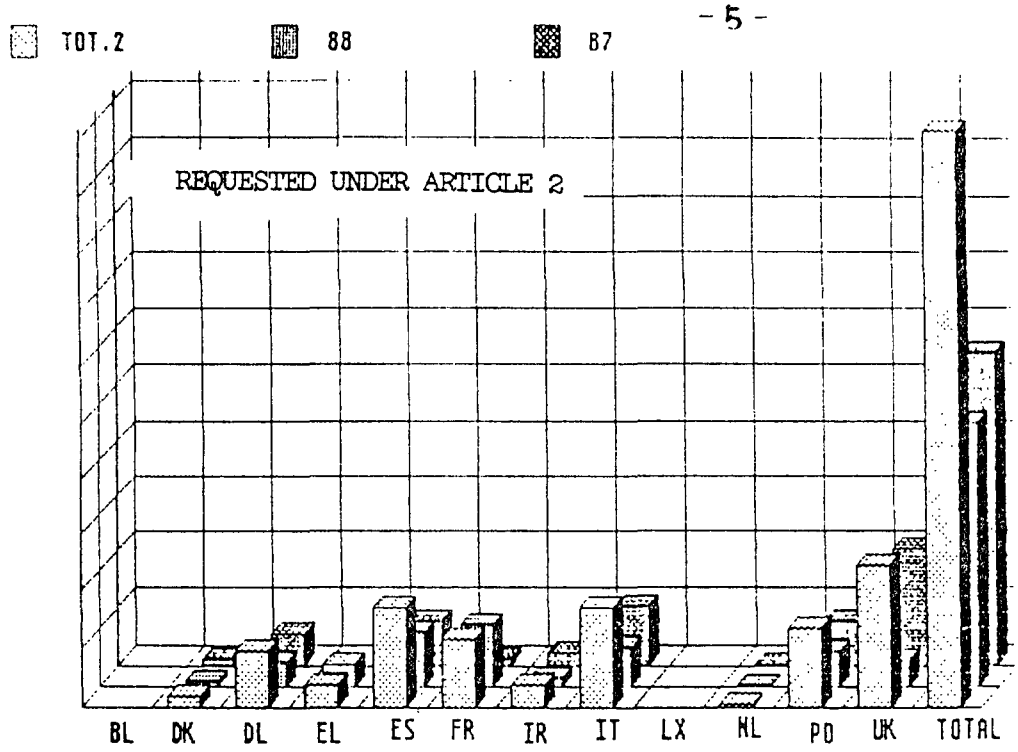

Figure 1: aid requested in 1987 and 1988

It can be seen that in 1988 the Community contribution requested for the forest damage observation network was slightly lower than in 1987. Although most countries only submitted one application a year, five projects were presented by the German Länder, and Belgium and Luxembourg made no application at all despite having already completed their inventory by the end of 1988. It appears that some countries or regions set up their network and carried out their observations without requesting any financial assistance at all.

Table 2 shows the number of observation points for which assistance (for insallation and observation) was requested over the two-year period. It also shows whether the observation network was complete at the end of the two years (and thus whether any more claims for assistance with installation can be expected).

	BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK
Number of observation points	/	21	208	60/70	645	290	22	238	/	14	180	81
Network complete	YES	YES	YES	no	YES	no	YES	YES	YES	YES	no	YES

After two years of Article 2 of the Regulation being in force, three German Länder, Ireland, Italy, the Netherlands and the United kingdom had requested assistance in setting up a complete network of observation points; thus any subsequent applications these countries might make will only involve the cost of observation itself.

It should be noted that the projects submitted in 1987 and 1988 do not always include observation points in maquis or other typical kinds of Mediterranean vegetation. The best way to adapt Community damage observation methodology to such areas will be decided in 1989.

I.2.2. PROJECTS APPROVED BY THE COMMISSION

All 11 projects submitted for 1987 were approved, resulting in a total contribution of ECU 182 210; 10 out of 11 projects submitted for 1988 were also approved. The only project not to win approval was the United Kingdom, on the grounds that it had already been given a five year grant in 1987.

Table 3 gives the breakdown by country of the number of projects approved and the assistance granted. Figure 2 shows the levels of assistance in 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK	TOTAL
NBR.	87		1	3		1	1	1	1		1	1	1	11
PROJECTS	88		1	2	1	1	1	1	1		1	1		10
TOT.2 YEARS			2	5	1	2	2	2	2		2	2	1	21
AID	87		3816	17489		25250	3255	4510	34362		1061	24955	67512	182210
GRANTED	88		2522	14005	12260	31353	34680	2324	22016		1059	19828		140047
TOT.2 YEARS			6338	31494	12260	56603	37935	6834	56378		2120	44783	67512	322257

Table 3: Number of projects approved by the Commission and aid granted for 1987 and 1988

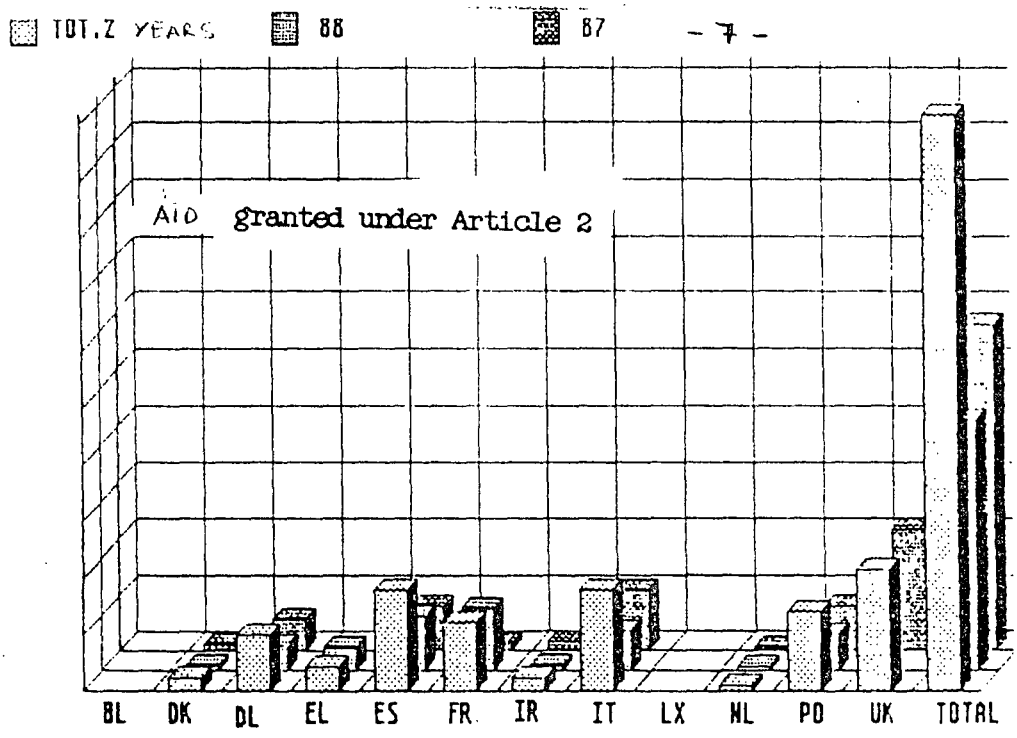

Figure 2 : Level of aid for 1987 and 1988.

The total assistance granted in 1987 and 1988 was virtually identical to the overall contribution requested, leaving aside the United Kingdom project for 1988 (see above) and the Irish project for 1988 (installation of observation points) which had already been approved in 1987.

Actual payments

By February 1989, payment claims for eight of the twenty projects approved by the Commission, had been made. All were 1987 projects and involved a total of ECU 77 408.

Payment is contingent upon receipt of completed observation sheets from the observation points in the Community network which are eligible for assistance.

II FOREST HEALTH REPORT (Article 3)

Pursuant to Article 3 of Regulation 3528/86 and in accordance with Article 3 of Regulation 1696/87, each Member State has to draw up an annual forest health report. This report is based on data from the Community inventory referred to in Article 2 and from any other denser regional or national inventories modelled on the common methodology.

Member States send this report to the Commission before 15 January each year. The report should i) describe how the inventory was drawn up, ii) present the findings, iii) suggest possible causes for any damage observed, iv) list measures taken to restore damaged forests and v) examine the socio-economic impact of forest die-back.

In 1987, 10 Member States supplied a forest health report. The following year, 12 such reports reached the Commission.

The density of the network varies from country to country and sometimes even within a country. Italy, the United Kingdom, Ireland, Denmark, Greece, Portugal and Spain use the 16 km x 16 km Community grid for the report, although other countries usually work with a denser network.

Like the forest damage inventories, the results of national surveys are sometimes incorrectly presented, late or incomplete, greatly complicating the task of recording and summarizing the data.

The findings of the periodic national reports for 1987 and 1988 appear in the report on the health of Community forests in 1987 and 1988.

III FIELD EXPERIMENTS, PILOT AND DEMONSTRATION PROJECTS (Article 4)

Pursuant to Article 4 of Regulation 3528/86, Member States may submit to the Commission applications for financial assistance in carrying out :

a) experiments in the field to improve understanding of atmospheric pollution in forests and its effects on forests, and to devise methods of maintaining and restoring damaged forests;

b) pilot and demonstration projects to improve methods of observing and measuring damage to forests.

III.1 PROJECTS SUBMITTED BY MEMBER STATES

Member States have so far submitted 66 projects to the Commission under Article 4 (33 in 1987 and 33 in 1988) representing a total cost of ECU 33 838 070 (ECU 20 989 646 for 1987 and ECU 12 848 424 for 1988).

The amount requested from the Community, whose contribution cannot exceed 30% of the total cost of the project, was ECU 8 970 158 for the two years (ECU 6 164 604 for 1987 and ECU 2 805 554 for 1988).

Table 1 shows the breakdown by country of the number of projects, their total cost and the assistance requested for the two years: Figure 1 shows the level of assistance requested in 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK	TOTAL
NBR PROJECTS	87	2		11	1	1	1		2	1	1	1	12	33
	88			13	1	1	1	2	10			2	3	33
TOTAL		2		26	2	2	2	2	12	1	1	3	15	66
TOTAL COST	87	787280		7294718	321425	160280	28935		4253748	110730	1747689	492950	5791891	20989646
	88			4779574	314384	83464	68046	478084	3685066			642502	2797204	12848424
TOTAL		787280		12074292	635809	243744	96981	478084	7938814	110730	1747689	1135552	8589095	33838070
AID REQUESTED	87	105249		2189665	96427	48084	5787		1276124	33519	524306	147885	1737558	6164604
	88			1353532	94315	25039	20414	143424	692825			192780	283225	2805554
TOT		105249		3543197	190742	73123	26201	143424	1968949	33519	524306	340665	2020783	8970158

Table 1: Number of projects, total cost and AID requested for 1987 and 1988 (Article 4 of Regulation 3528/86)

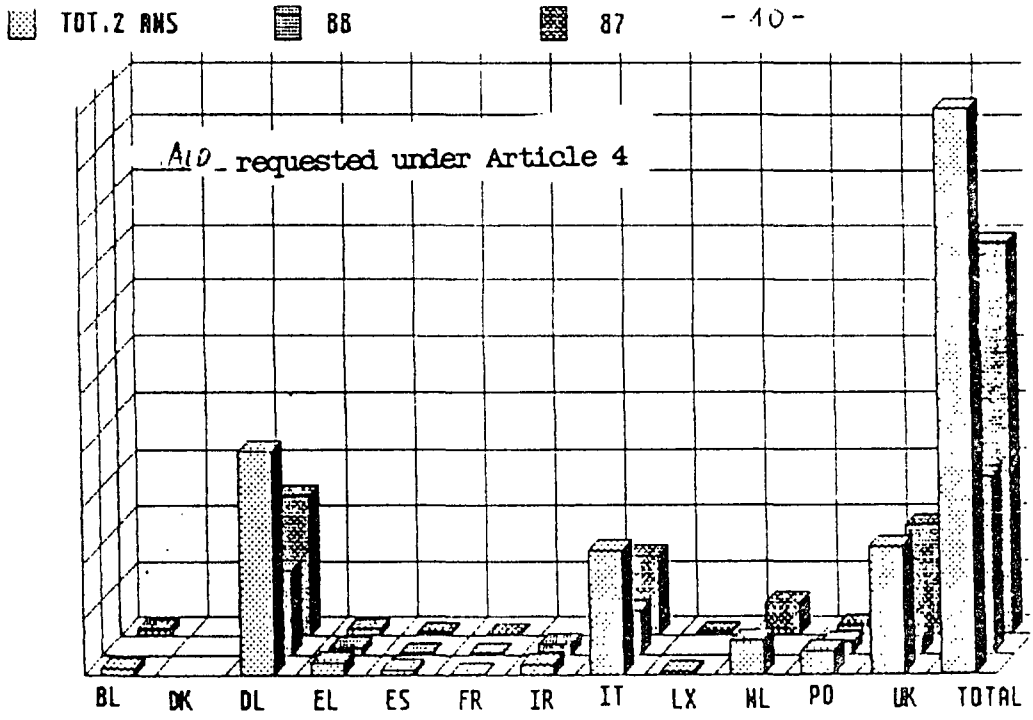

Figure 1: Level of aid requested in 1987 and 1988

It can be seen from the table that the Federal Republic of Germany submitted the largest number of projects, as well as the largest request for assistance, followed by the United Kingdom and Italy. Belgium, the Netherlands and Luxembourg only submitted projects in 1987, while Ireland did so only in 1988. Denmark made no application for Community financing under the Regulation.

The total assistance requested in 1988 was lower than in 1987; this was particularly the case for the FRG, Italy and the United Kingdom, although the number of projects was the same. The French and Portuguese applications were slightly higher, but Spain's was lower. Greece submitted the same application in both years.

III.2 PROJECTS APPROVED BY THE COMMISSION

For 1987, 15 projects were approved by the Commission, compared to 22 for 1988, making a total of 37 projects.
The total assistance granted for the two years was ECU 2 886 609, or ECU 1 462 233 for 1987 and ECU 1 424 376 for 1988.

Table 2 shows the breakdown by country of the number of projects approved and the assistance granted. Figure 2 shows the level of assistance granted in 1987 and 1988.

		BL	DK	DE	EL	ES	FR	IR	IT	LX	NL	PO	UK	TOTAL
NBR.	87	1	3	1	1	1				1	1		4	15
PROJECTS	88		9		1	1	2	3					2	22
TOTAL		2	13	1	2	2	2	3	1	1	1		6	37
AID	87	73825	422106	96427	42084	5787				33519	524306		258179	1462233
GRANTED	88		559177		25039	20414	143424	467253					209069	1424376
TOTAL		73825	981283	96427	73123	26201	143424	467253		33519	524306		467248	2886609

Table 2: Number of projects approved by the Commission and aid granted for 1987 and 1988.

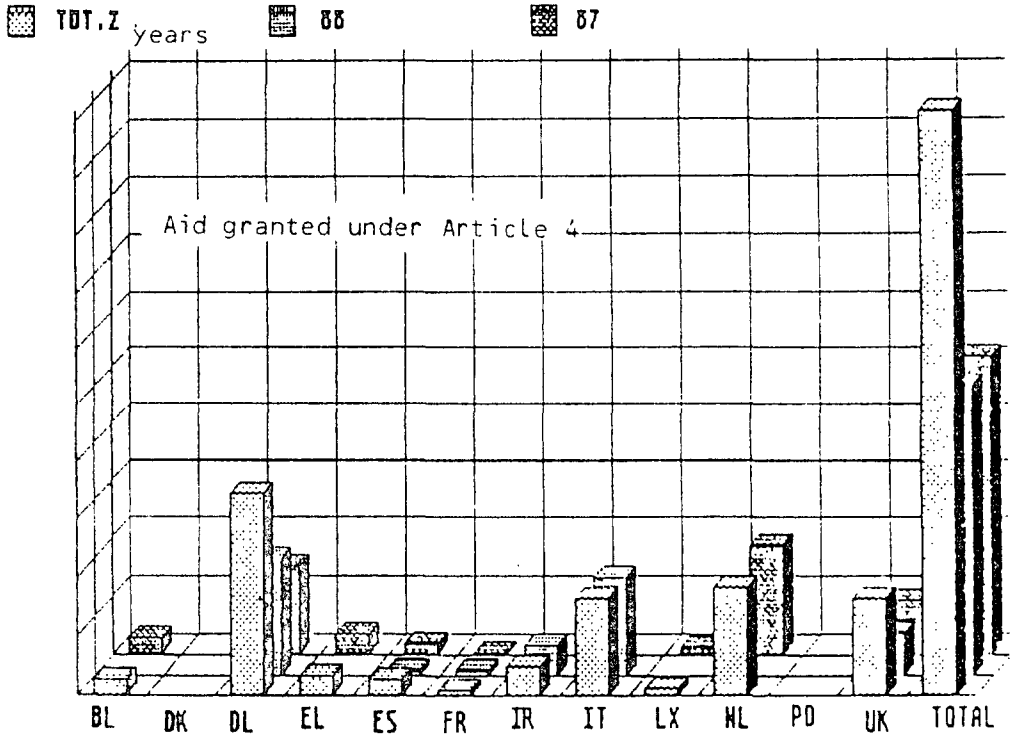

Figure 2 : Level of aid granted for 1987 and 1988

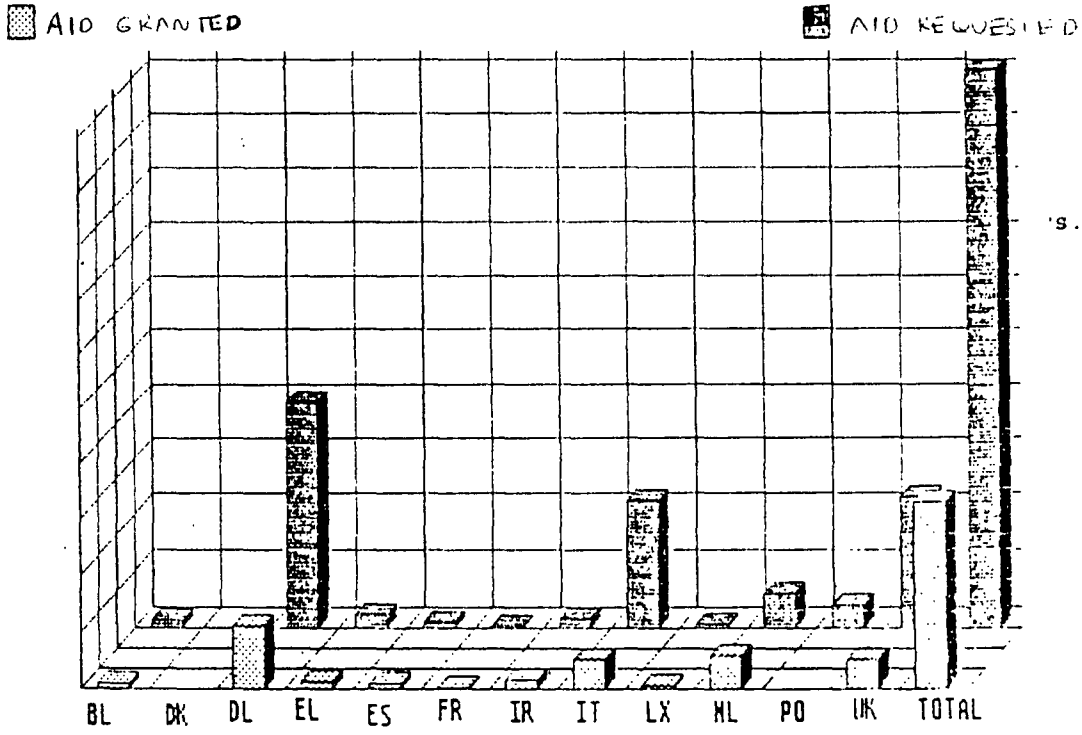

Figure 3 : aid requested and granted

The highest sums were granted to the FRG, followed by the Netherlands, Italy and the United Kingdom (Community contribution ranging from ECU 981 283 to ECU 467 248). The other countries received grants of between ECU 143 424 (Ireland) and ECU 33 519 (Luxembourg).

As a rule, the projects submitted for 1988 were better presented, less expensive and more in tune with the objectives of Article 4 of Regulation 3528/86.

The selection criteria are listed below :

- the project should be of a pilot or demonstration nature or involve experiments in the field (pure research projects were ruled ineligible);
- conformity with the objectives defined in the Regulation;
- clear objectives and methodology;
- realistic work programme in relation to the time schedule proposed;
- reasonable cost;

- compliance with administrative requirements;

- guarantee of no double-financing by the Community.

Characteristics of approved projects

On the basis of Article 4 of Regulation 3528/86, projects may be divided into four categories to which, for the sake of clarity, we have added another one for projects covering more than one category :

- category 1 : experiments in the field to improve understanding of atmospheric pollution in forests;
- category 2 : experiments in the field to improve understanding of the effects of atmospheric pollution on forests;
- category 3 : pilot and demonstration projects to improve methods of observing and measuring damage to forests;
- category 4 : experiments in the field to devise methods of maintaining and restoring damaged forests;
- category 5 : integrated projects.

Table 3 shows the number of projects approved in each category by country over the two-year period. Figure 4 shows the breakdown, by category, of projects approved for the years 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LI	NL	PO	UK	TOTAL
CAT.1	87			1						1			1	2
	88							1	3					4
TOT				1				1	3	1			1	6
CAT.2	87		1	2									3	6
	88			3				1	2				1	7
TOT.			1	5				1	2				4	13
CAT.3	87			2			1							3
	88			1					1					2
TOT.				3			1		1					5
CAT.4	87			1							1		1	2
	88			3			1						1	5
TOT.				4			1				1		1	7
CAT.5	87				1	1								2
	88			1		1			7					4
TOT.				1	1	2			2					6

Table 3: Number of projects approved by category

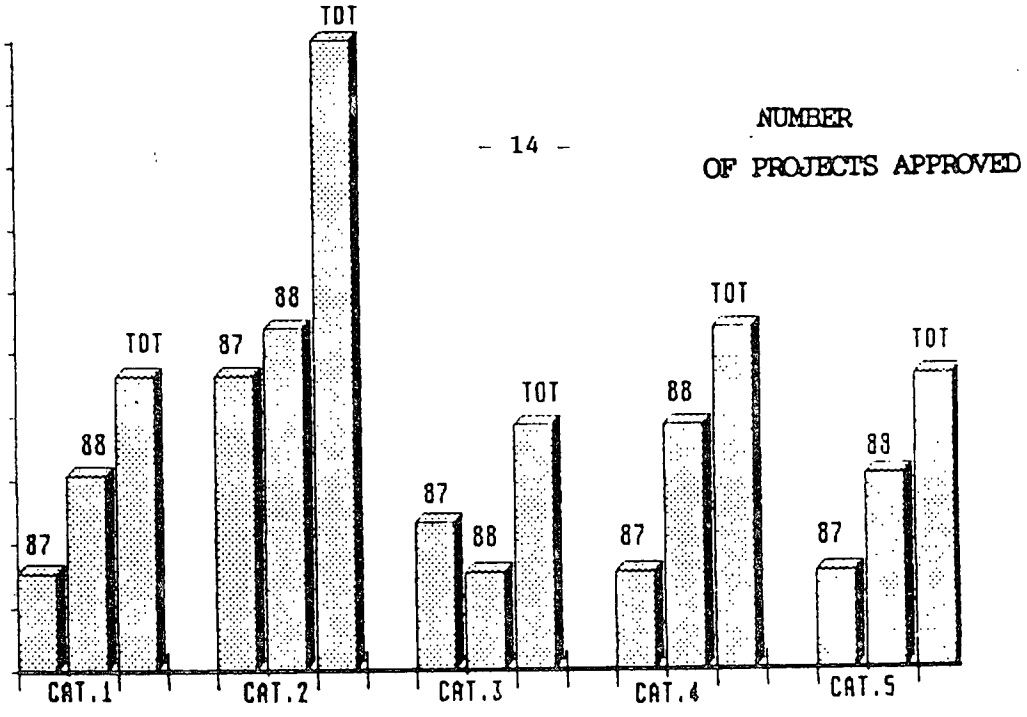

Figure 4: Classification of projects by category

Category 2 contains the largest number of projects, the other categories being more or less equal. It should be noted, however, that most of the projects under category 5 cover categories 1 and 2.

Most of the projects approved involve the establishment of permanent plots for observing the effects of atmospheric pollution on forests, with, in some cases, facilities for pollution analysis.
On permanent plots the forest ecosystem can be studied in much more detail than at the observation points making up the Community network (Article 2).
The aim of field experiments is to show the effects of atmospheric pollution on vegetation, soil, water and air and to study the way in which they evolve over time.
Morphological analyses are usually carried out in forest stands and involve the study of changes in the stem-root ratio and the different categories of damage, while physiological analyses (leaf analyses) are undertaken to identify any nutritional deficiencies; the economic aspect of forest die-back may also be examined (growth studies).
Some projects include the study and analysis of plants known to be pollution indicators.

Soil analyses are also carried out to detect nutritional deficiencies and pollutants and to assess the impact of these on mycorrhizae. Close attention is also paid to dry and wet atmospheric deposition.

Studying air and rain water quality involves setting up special sampling stations - these can be integrated within a "permanent plot" project or submitted on their own. The main role of these stations is to analyse, on a continuous or periodic basis, the quality of rainwater (pH, ion content : $SO_4^-/NO_3^-/Cl/NH_4/Ca^{++}/Mg^{++}$, electrical conductivity, etc.) and air (in particular, SO_2, NO_x, O_3), in conjunction with recording meteorological data.

Category 3 comprises five projects, the aim of which is to improve methods for observing damage through the use of appropriate data, especially from remote sensing (aerial and satellite). Such techniques supplement the ground-based inventory by using photos to ascertain tree vitality and making interpretation of the results more objective. In addition, two projects submitted by Spain (under category 5) also involve using remote sensing to study a badly damaged forest area.

Category 4 contains seven projects. These involve field experiments to devise methods for maintaining or restoring damaged forests through fertilizer techniques.
These often involve adding lime, and perhaps magnesium and/or potassium as well. Fertilizer placement techniques in forests are also being studied (mainly by a Netherlands project approved in 1987. Two projects simply propose adding lime, and inoculating with earthworms. The impact of these practices is assessed by monitoring the nutritional balance at forest stand and soil levels.
The economic aspect of fertilizer use for restoring dying forests is also under study.

The duration of these projects varies from several months to five years. Table 4 gives a breakdown of the number of projects approved for 1987 and 1988 according to their duration.

	< 1 year	2/3 years	4/5 years
87	4	5	6
88	8	10	3
TOTAL	12	15	9

Most projects have a duration of two to three years, although the average duration of projects submitted in 1988 is lower than for those submitted in 1987.

Progress of work and payments made

By February 1989, only six of the 37 projects approved by the Commission in 1987 and 1988 had been the subject of a payment application (representing a total of ECU 368 057). None of these projects has been completed and the balance of the contribution outstanding for the 6 projects is ECU 597 829.

There is not enough data at the moment to say how far work has actually progressed. Many of the beneficiaries of the projects have already set up their experiments and the first results are beginning to come in. Over the next few months, these will be incorporated into the reports which have to accompany each payment application.

IV : COORDINATION OF ACTION (Article 5)

Under Article 5 of Regulation 3528/86, the Commission is responsible for coordinating Community action to protect forests against atmospheric pollution.

Three working parties have been set up in the following areas :

IV.1 INVENTORY OF FOREST DAMAGE

This group meets to discuss the practical problems involved in carrying out the inventory of forest damage (Articles 2 and 3), and the resulting findings.

The experts taking part in these meetings are responsible for carrying out the inventory in the field; this means experiences in the 12 Member States can be compared, technical information exchanged and effective coordination ensured.

The group has close links with the working group of the cooperative programme for the evaluation of damage to forests (Geneva Convention on Long-Range Transboundary Air Pollution).

IV.2 DIAGNOSIS OF FOREST DAMAGE IN THE MEDITERRANEAN REGION

The systematic inventory of forest damage poses special problems in respect of maquis and other forms of vegetation typical of the Mediterranean region.

The working group studying this area is looking into ways of adapting the common inventory methodology to these kinds of vegetation (access and transport difficulties, density of vegetation etc.).

Practical proposals supplementing the methodology described in Regulation 1696/87 have been submitted to the working group referred to in IV.1 above.

Both these working groups have had the opportunity, during field visits, to see for themselves how the inventory is being carried out in practice.

IV.3. APPLICATION OF REMOTE SENSING TO FOREST DAMAGE OBSERVATION

This group is working on the development of a common method for monitoring forest health using aerial and satellite remote sensing techniques to complement action at ground level.

V : COMMITTEE ON FOREST PROTECTION (Article 6)

In accordance with Article 6 of Regulation 3528/86, a Committee on Forest Protection has been set up. This Committee acts as a regulatory committee or as an advisory committee, depending on the subject being dealt with.

During the first two years of application of Regulations 3528/86 and 3529/86, the Committee met three times : on 27 and 28 February 1987, on 6 and 7 May 1987, and on 1 March 1988.

At the first meeting, the Committee drew up its own rules of procedure (Article 10) and consulted delegations about the methods and criteria for implementing the regulations.

The second meeting involved consultations with delegations (in accordance with Article 8) on the projects submitted by Member States to the Commission for 1987 under Regulation 3529/86 and Article 4 of Regulation 3528/86. The Committee also gave its opinion (in accordance with Article 7) on three draft Commission Regulations laying down certain detailed rules for implementing Regulations 3528/86 and 3529/86.

At the third meeting, delegations were consulted on the projects submitted by Member States to the Commission for 1988 (Regulation 3529/86 and Article 4 of Regulation 3528/86).

These meetings provide delegations and Commission staff with the opportunity to exchange information on the steps taken to protect forests against fire and atmospheric pollution as well as on any problems arising in the course of implementing the two Regulations.

VI : PROPOSED COUNCIL REGULATION AMENDING REGULATION (EEC) No 3528/86

In its communication to the Council on a Community strategy and action programme for the forestry sector (1), the Commission proposed strengthening Community action to protect forests against atmospheric pollution.

The new measures proposed were as follows :

- Encouragement for the carrying out of pilot projects for maintaining and restoring damaged forests;

- Adoption of a programme for the synoptic processing of information on knowledge of atmospheric pollution in woodland and its effects;

- Increase of ECU 7 million in the total amount of expenditure provided for in Regulation (EEC) No 3528/86, representing an increase of ECU 3.5 million for each of the two years remaining before the expiry of the Regulation.

(1) COM(88) 255 final of 23 September 1988.

VII : OVERALL CONCLUSIONS

After two years of application of Regulation 3528/86, there is no doubt about the interest of Member States in the possibilities offered by Articles 2 and 4.

Under these two Articles, 58 projects have been approved by the Commission, resulting in a total Community contribution of ECU 3 208 866.

Although it is too early to draw any conclusions from the findings of the pilot and demonstration projects referred to in Article 4, observation of the health of European forests (Articles 2 and 3) over a two-year period has enabled a detailed report on forest damage in the Community in 1987 and 1988 to be drawn up.

The coordination of action (Article 5) is currently in the hands of three groups of experts; it has mainly involved the inventory of forest damage, but is soon to be extended to pilot and demonstration projects. In addition, the Committee on Forest Protection (Article 6) plays a major role in assisting the Commission to implement Community action provided for in the Regulation. Meetings allow delegations to exchange information on the protection of forests against fire and atmospheric pollution.

In addition, as a result of the Commission's proposals for strengthening Community action to protect forests against atmospheric pollution the budget will be increased and further steps taken under the basic regulation to restore damaged forests and provide information on knowledge of atmospheric pollution in forests and its effects. The increase in the Community financing component from 30 to 50% for Article 4 projects will make the Regulation that much more attractive to those potential applicants who are not in a position to contribute 70% of the costs.

IMPLEMENTATION OF REGULATION (EEC) No 3529/86

CONTENTS

Council Regulation (EEC) No 3529/86 of 17 November 1986 on protection of the Community's forests against fire[1] took effect on 1 January 1987. The cost of implementing it over a five-year period was estimated by the Council to be ECU 20 million.

The purpose of the Community scheme introduced by the Regulation is to help Member States provide increased protection for forests by applying the following preventive measures:

(a) encouragement for forestry operations designed to reduce the risk of fire;

(b) encouragement of the purchase of brush-clearance equipment where indispensable;

(c) the provision of forest roads, fire belts and water supplies;

(d) the installation of fixed or mobile look-out structures;

(e) the organization of information campaigns;

(f) assistance in establishing interdisciplinary data-gathering centres and assistance for subsequent analytical studies of the data gathered.

These measures are supplemented by the following:

- encouragement for the training of highly specialized personnel;

- encouragement for the harmonization of techniques and equipment;

- coordination of the research necessary for implementing the measures referred to in the first and second indents.

The Community contribution towards programmes and projects submitted by the Member States to the Commission as part of this scheme is a maximum of 30% of the expenditure approved by the Commission.

Projects are submitted to the Commission before 1 November each year. The Committee on Forest Protection, set up under Article 6 of Regulation (EEC) No 3528/86, is consulted on the measures that the Member States intend to adopt pursuant to this Regulation and on the programmes and projects submitted by them as part of the scheme.

(1) OJ No L 326, 21.11.1986.

I: FOREST FIRES IN EUROPE

Forest fires occur principally in the Mediterranean region. Whilst they can cause considerable damage in more northern regions, they are not at all as serious or as frequent as in southern Europe.

In southern Europe the circumstances are such that the smallest outbreak, especially in summer, assumes enormous, and indeed catastrophic, proportions if not detected early. The risk is genuinely a permanent one.

The figures and comments given here are concerned mainly therefore with situations encountered in the Mediterranean area.

I.1 Figures

Table 0.1 shows the number of forest fires in the principal countries affected between 1980 and 1987.

	FR	ES	EL	IT	PO	Σ
1980	5040	7193	1207	5660	2349	21449
1981	5173	10882	1159	8150	6640	32004
1982	5308	6443	1045	6134	3567	22497
1983	4659	4880	968	5556	4503	20566
1984	5672	7224	1284	5227	6377	25784
1985	6249	12284	1442	12621	7218	39814
1986	4353	7713	679	5341	4348	22434
1987	2975	8316	986	7647	6267	26191
$\bar{x}$	4929	8117	1096	7042	51590	26342

Table 0.1 : Number of forest fires

The number is considerable. On average, these five southern European countrties have 26 000 fires annually. Since the most sensitive period generally is daylight hours, that gives an average of 18 fires per hour.

It should be pointed out, however, that most of these are put out, thanks to rapid detection and fire-fighting facilities.

To obtain a true idea of the scale of the problem, it is therefore important to consider also other data, namely the area burnt, the surface are of the average fire and the number of large fires. Table 0.2 shows the areas burnt by country.

	FR	ES	EL	IT	PO	Σ
1980	22176	265954	32965	144302	44260	509657
1981	27711	298436	81417	242218	89798	739580
1982	55145	151644	27372	130239	39557	403957
1983	53729	117599	19613	223728	49380	464049
1984	27202	164546	33655	78326	52713	356442
1985	57368	486327	105450	189898	146255	985298
1986	51860	284450	13410	26094	99522	475336
1987	10087	136992	48680	48012	103500	347271
x̄	38160	238243	45320	135352	78123	535199

Table 0.2 : Areas burnt out

It is rather difficult to make a comparison of the areas burnt between the different countries since the word "forest", in the Mediterranean region is interpreted in different ways and the figures for the area under forest are not always comparable.

Trends indicate clearly, however, that the area burnt, by country, is highest in Spain and Italy and lowest in France. Significant variations occur also from year to year. The worst years (1981 and 1985) were common to all countries, however, which shows how important weather conditions are.

In Europe, in eight years, 4.3 million ha were burnt. By way of illustration, this is equivalent to the entire Mediterranean area under forest in France.

More than 1% of forest is destroyed each year in the Mediterranean region, i.e., 0.9% in France, 1.9% in Spain, 0.8% in Greece, 2.4% in Italy and 2.6% in Portugal.

Table 0.3 shows the area of the average fire for each country and year.

	FR	ES	EL	IT	PO	$\bar{x}$
1980	4.40	36.97	27.31	25.50	18.84	22.60
1981	5.36	27.42	70.25	29.72	13.52	29.25
1982	10.39	23.54	26.19	21.23	11.09	18.49
1983	11.53	24.10	20.26	40.27	10.97	21.43
1984	4.80	22.78	26.21	14.98	8.27	15.41
1985	9.18	39.59	73.13	15.05	20.26	31.44
1986	11.91	36.88	19.75	4.89	22.89	19.26
1987	3.39	16.47	49.37	6.28	16.52	18.41
$\bar{x}$	7.62	28.47	39.06	19.74	15.29	22.04

Table 0.3 : Area of the average fire

The area of the average fire is very large in Greece and Spain but much smaller in France.

These figures give some idea of how effective fire-prevention and fire-fighting structures are. They indicate what needs to be done and how much.

Every effort must be made to reduce this average area since, while it is difficult to limit the number of outbreaks, it is imperative that they be extinguished very quickly.

This is the ongoing concern of the bodies responsible, since there is virtually an exponential link between the are burnt and the time taken by the fire-fighting services to arrive.

Thus, in France, between 1980 and 1988, 1.4% of the number of fires covered an area of more than 100 ha and were responsible for the destruction of 71% of the total area destroyed.

I.2 Causes

The implementation of a coherent fire-prevention policy calls for the measures to be adapted to each category of cause, which implies a proper understanding of the causes.

Fires can be of human origin. These are due mainly to:

- infrastructures (rubbish tips which are often located in forests set alight spontaneously or wilfully, power lines, railway lines, vehicle exhausts);
- lack of care (forestry work, farm work, children's games, cigarette ends thrown from vehicles, accidents, pedestrian smokers, use of stoves, burning of agricultural waste);
- wilful malice (alteration of land use, speculation in timber product prices, personal revenge, etc);
- pathological malice.

They may also be of natural origin. These consist mainly of fires caused by lightening, the origin of which is the considerable number of "dry" storms in periods of drought.

It is difficult, therefore, to determine accurately the causes of fires.

For France, figures produced by the data processing centre of the department of Bouches du Rhône (Opération Prométhée) give 40% of the causes of all fires as known.

Table 0.4 gives for each category of causes the relevant proportion of fires and the area burnt out.

	N° of fires %	Area burnt %	Area burnt /ha
Accident	10	10	8
Work	50	15	3
Malice	15	30	19
Tourism	20	40	18
Other	5	5	8

Table 0.3 : Proportion of the number of fires, proportion of the area burnt, and the area burnt in ha.

These figures, covering south-eastern France only, show that, while not the most frequent causes, malice and tourism cause the greatest damage.

Farm work, forestry work, etc. is admittedly responsible for a larger number of outbreaks, but the damage is less extensive since the persons who cause the fires are often on the spot.

Fires sparked off by lightening are much rarer.

An effective fire prevention scheme must therefore, take account of these factors and concentrate on fires caused maliciously or by tourists.

I.3 Fire prevention

An examination of the data on the scale of forest fires in Europe and on their origin indicates clearly the policy to be applied to prevention.

Information and public awareness campaigns should help reduce the number of outbreaks. As for the size of the average fire and the number of large fires, these could be reduced by the deployment of effective fire prevention and fire-fighting facilities.

A prevention policy must include measures to:

- inform and alert the public;

- examine and, if necessary, amend national laws. The latter must not be the cause of fires. Changes of land use must be strictly controlled, chiefly in the case of potential urban development, woodland grazing, the establishment and management of rubbish tips, land clearance and the safety of infrastructure installations.

  Steps must be taken also to ensure the sound management of established prevention systems and coordination of the various administrative and policy bodies involved at both regional and national level;

- Establish an effective fire-watch infrastructure with the aim of:

  . shortening the alarm period so that action can be taken speedily on the outbreak of fire (fire-watch patrols, infra-red cameras, look-out towers, etc.);

  . making optimum use of the available fire-fighting resources by providing facilities (tracks, firebelts, water supplies, etc.);

  . deploying adequate fire extinction resources as quickly as possible;

- Implement forestry operations with the aim of selecting species which are less susceptible to combustion and of creating vertical and horizontal breaks within stands (thinning, brush clearance).

1.4 Grounds for Regulation (EEC) No 3529/86

In spite of the existence of fire-prevention measures, forest fires affect 500 000 ha of forest annually, principally in the southern part of the Community. Mediterranean forests account for practically one third of Europe's total forest area. These southern regions of Europe also play host each year to an influx of around 100 million European tourists, putting even greater pressure on forests.

It was crucial that all Member States act in unison to prevent forest fires in order to safeguard an integral part of Europe's heritage.

The Council felt that encouragement should be given to Member States to step up their fire-prevention measures in order to reduce the number and size of outbreaks.

The Community scheme introduced by Regulation (EEC) No 3529/86 of 17 November 1986 allows a contribution to be made towards the financing of the techniques, equipment and products required for prevention, and of supplementary measures to harmonize those techniques and equipment, by establishing close cooperation between Member States and the Commission.

In practice, under Regulation (EEC) No 3529/86, there may be part-funding of the preventive measures listed in point 1.3, leaving aside the question of legislative problems and direct fire control.

It should be noted, however, that the funds allocated by the Community to the scheme are relatively small compared with those set aside by each southern European Member State for fire prevention and control.

Table 0.4 gives an indication of the extent of the funds set aside annually for forest fires in those countries for which we have information (Source: Ministry of Agriculture of the countries concerned).

Country	Prevention (ECU million	Control (ECU million)
Greece	14,5	-
France (not including IMPs)	54	71
Spain	35	44

Set against the number of hectares woodland, this gives the following figures :

Country	Area of Mediterranean forest	Amount/ha
Greece	5,7 million ha	2,5 ECU/ha
France	4,2 "	12,85 "
Spain	12,5 "	2,8 "

Table 0.4: Funds set aside for forest fires (Source: Ministry of Agriculture of the countries concerned).

It is important to note that these figures do not include investments by those Member States under the structural regulations covering forestry (IMPs, PEDAP, special Regulation (EEC) No 1118/88 for Spain).

Funds available under the Regulation, on the other hand, provide average aid of ECU 0.125/ha only.

The Community scheme is therefore a supplement or aid to the national forest fire prevention policies. It is innovative in that it approaches the problem from a Community angle, notably by promoting harmonization of techniques and equipment, the setting up of data-collection centres and the coordination of the research needed for implementing proposed measures.

II: PROGRAMMES AND PROJECTS UNDER REGULATION (EEC) No 3529/86

Pursuant to Article 3 of Regulation (EEC) No 3529/86, Member States may submit to the Commission programmes or projects to increase the protection of forests against fire.

II.I Projects presented by the Member States

For the first two years of application of the Regulation, the Member States submittd to the Commission 131 projects (51 in 1987 and 81 in 1988).

The total cost of the projects presented amounted to ECU 65 327 915, i.e. ECU 23 031 886 for 1987 and ECU 42 296 029 for 1988.

The Community contribution sought (30% maximum of the eligible cost) was ECU 17 599 872 for the two years, i.e. ECU 5 775 776 for 1987 and ECU 11 824 183 for 1988.

Table 4 gives a breakdown by country of the number of projects, the total cost and the contribution requested for the two years. Figure 5 shows the aid requested in 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK	Σ
N° projects	87	0	0	2	3	4	29	0	3	0	7	1	2	51
	88	0	0	2	3	26	27	0	11	0	7	3	2	81
		0	0	4	6	30	56	0	14	0	14	4	4	132
Total cost	87	0	0	100867	2805591	4422138	11353292	0	2829792	0	429203	1072720	18283	23031886
	88	0	0	680134	2900509	17906984	12947910	0	5015405	0	407844	2415272	21971	42296029
		0	0	781001	5706100	22329122	24301202	0	7845197	0	837047	3487992	40254	65327915
aid requested	87	0	0	30260	841677	1326641	2050118	0	848937	0	128760	321815	5485	5553693
	88	0	0	208901	870152	5372046	3123111	0	1532460	0	122353	724580	6591	11960194
	Σ	0	0	239161	1711829	6698687	5173229	0	2381397	0	251113	1046395	12076	17513887

Table 4: Number of projects, total cost and aid requested for 1987 and 1988.

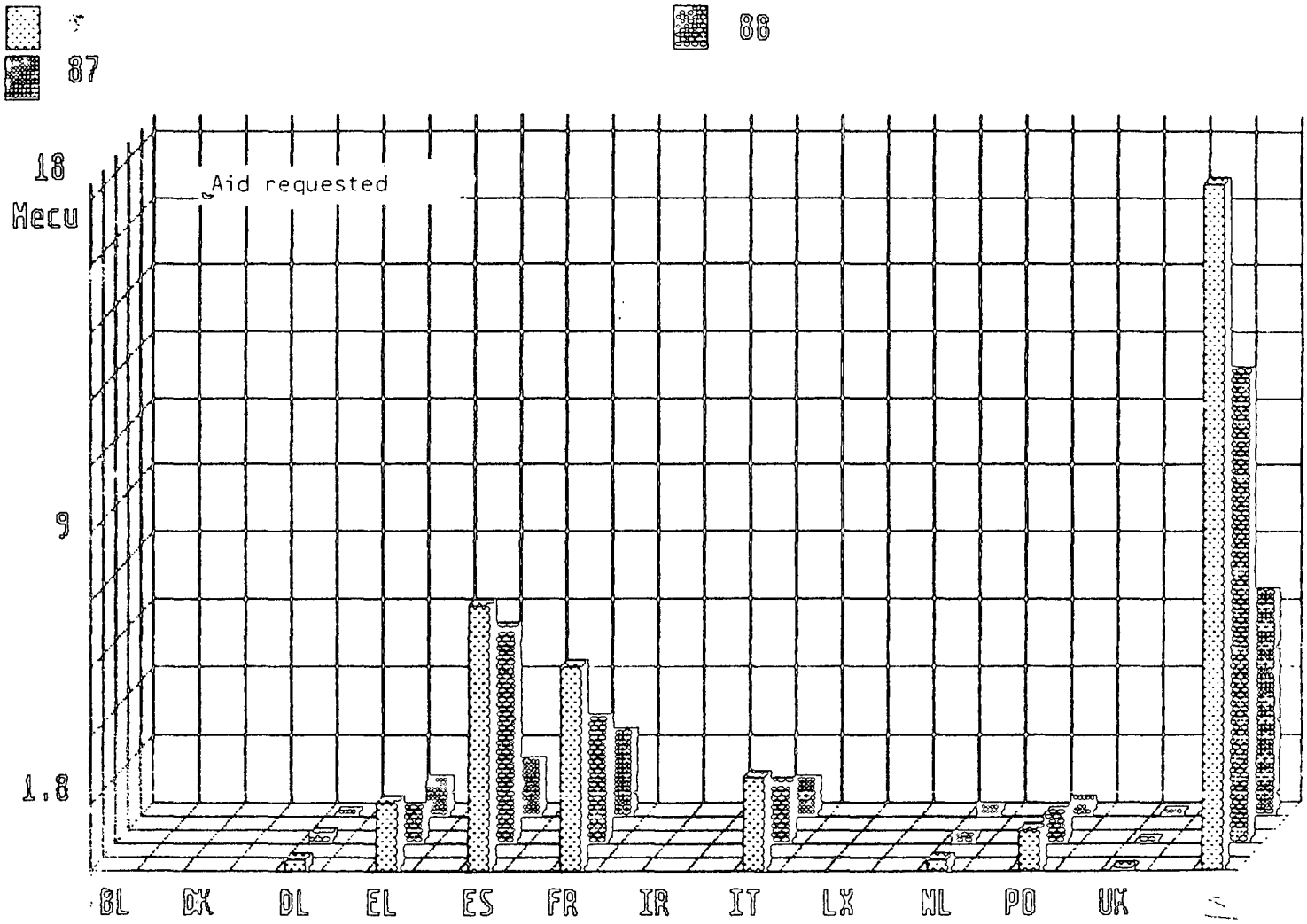

Figure 5 : aid requested in 1987 and 1988

It can be seen that five countries head the list of those requesting aid for the two years. They are the countries with Mediterranean plant formations, namely Spain, followed by France, Italy, Greece and Portugal. It should be noted also that France submitted the largest number of projects but for proportionately less cost than the other four Member States.

The Netherlands, Germany and the United Kingdom also submitted projects, but for smaller amounts.

A comparison of the projects submitted in 1987 and 1988 shows that the amount of aid sought more than doubled in the second year of implementation. This is understandable since the first year was a "running in" year for the Regulation.

II.2 Projects accepted by the Commission

The Commission accepted 42 projects in 1987 and 46 in 1988, i.e. 88 in all. The total aid granted for the two years was ECU 9 171 284, i.e. ECU 4 830 961 in 1987 and ECU 4 340 323 in 1988.

Table 5 gives a breakdown by country of the number of projects accepted and the aid granted. Figure 6 shows the aid granted in 1987 and 1988.

		BL	DK	DE	EL	ES	FR	IR	IT	LU	NL	PO	UK	
No project	87	0	0	2	3	4	20	0	3	0	7	1	2	42
	88	0	0	1	1	18	7	0	7	0	7	3	2	46
		0	0	3	4	22	27	0	10	0	14	4	4	88
Aid granted	87	0	0	30308	906092	1254196	1288621	0	881035	0	128856	336811	5042	4830961
	88	0	0	26425	697933	1125353	845489	0	791603	0	122350	724579	6591	4340323
		0	0	56733	1604025	2379549	2134110	0	1672638	0	251206	1061390	11633	9171284

Table 5 : Number of projects accepted by the Commission and aid granted for 1987 and 1988.

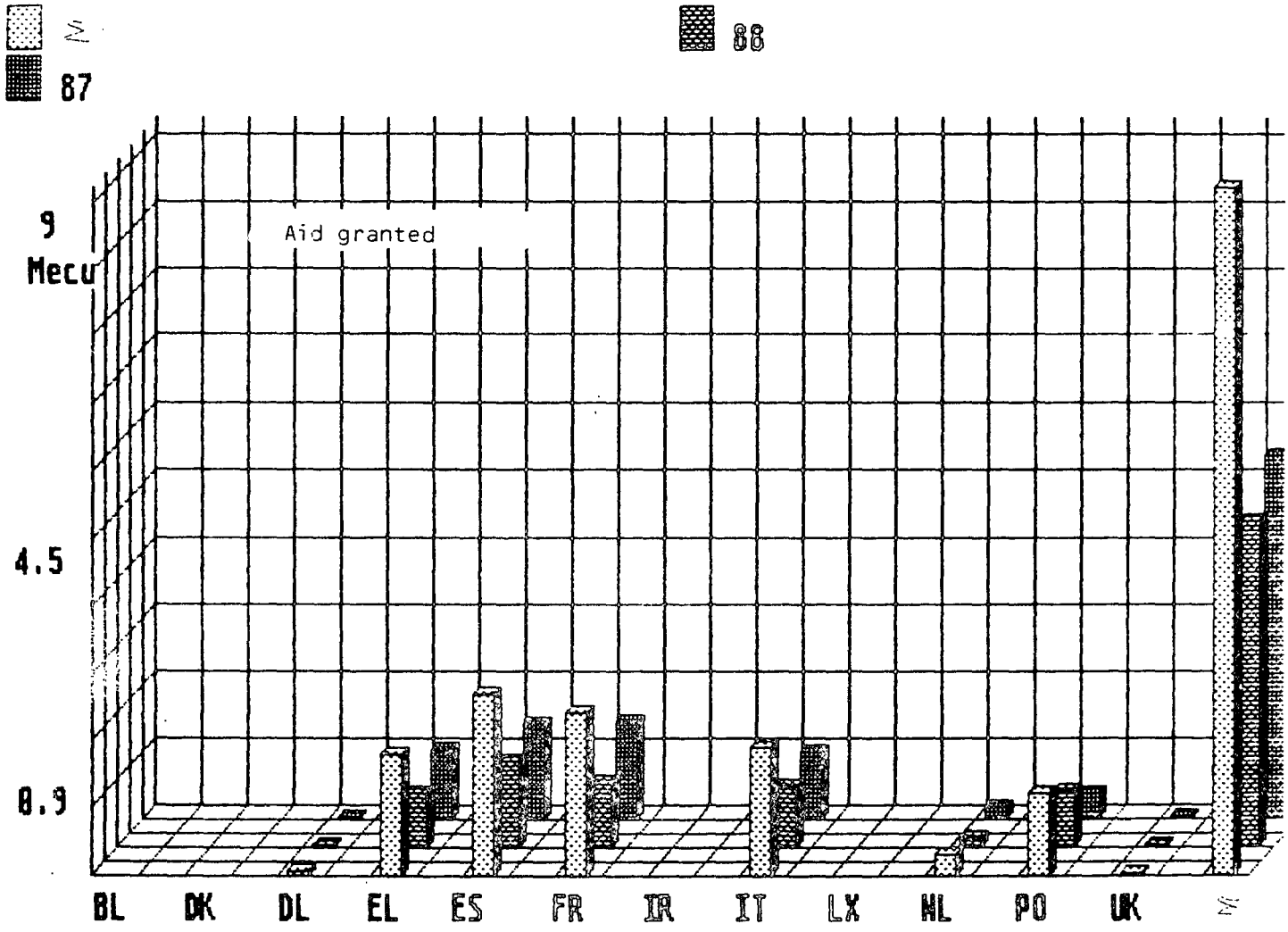

Figure 6 : Aid granted for 1987 and 1988.

Figure 7 shows the aid requested and aid granted for the two years.

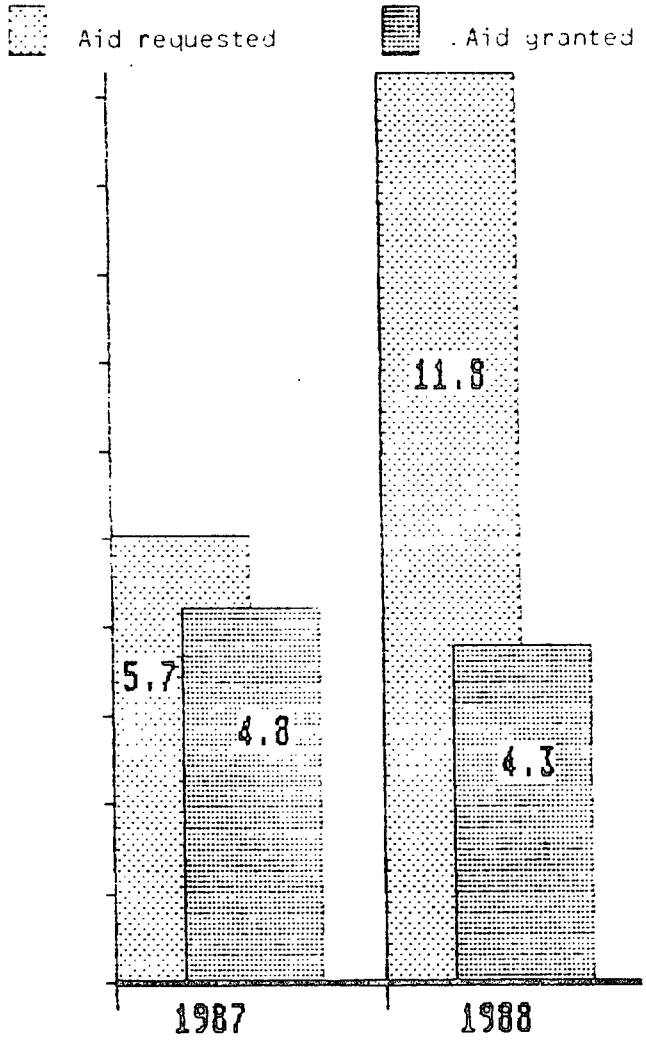

Figure 7 : Aid requested and aid granted

It can be seen that for the two years the highest amounts of aid were granted to Spain, followed by France, Italy, Greece and Portugal (Community contribution ranging from ECU 2 379 557 to ECU 1 061 390). The other countries received aid ranging from ECU 251 228 (Netherlands) to ECU 11 633 (United Kingdom).

While most projects submitted in 1987 were accepted (France being the only country where the amount sought was not fully met), this was not the case in 1988. Applications had increased appreciably and selection had to be more rigorous in the light of the funds available. Of the amount requested, 35% was granted, representing 50% of the total number of projects presented.

II.3 Characteristic features of the projects accepted

Pursuant to Article 2 of Regulation (EEC) No 3529/86 projects can be classified in the following nine categories:

Cat. 1 : Forestry operations designed to reduce the risk of fire.

Cat. 2 : Purchase of brush-clearance equipment.

Cat. 3 : Provision of forest roads, fire belts and water supplies.

Cat. 4 : Installation of fixed or mobile look-out structures.

Cat. 5 : Organization of information campaigns.

Cat. 6 : Establishment of interdisciplinary data-gathering centres.

Cat. 7 : Training of highly specialized personnel.

Cat. 8 : Harmonization of techniques and equipment.

Cat. 9 : Multi-purpose projects.

Table 6 shows the number of projects accepted and the aid granted in each category by country for the two years. Figure 8 gives a breakdown of the different categories of projects accepted for 1987 and 1988.

		BL	DK	DL	EL	ES	FR	IR	IT	LX	NL	PO	UK	Σ
CAT 1	87			26666										26666
	88			28928										28928
	Σ	0	0	55594	0	0	0	0	0	0	0	0	0	55594
CAT 2	87						164978							164978
	88						98312		273965					372277
	Σ	0	0	0	0	0	263290	0	273965	0	0	0	0	537255
CAT 3	87					114238	121951						5042	241231
	88					45029	456518							501547
	Σ	0	0	0	0	159267	578469	0	0	0	0	0	5042	742778
CAT 4	87						777218		122650		128856			1028724
	88					260688	71241		165454		122352	525144	4088	1148967
	Σ	0	0	0	0	260688	848459	0	288104	0	251208	525144	4088	2177691
CAT 5	87			3642	113013	870815	71580		204416					1263466
	88					237825	155305		351646					744776
	Σ	0	0	3642	113013	1108640	226885	0	556062	0	0	0	0	2008242
CAT 6	87					269143	152894							422037
	88					8628	64116							72744
	Σ	0	0	0	0	277771	217010	0	0	0	0	0	0	494781
CAT 7	87													0
	88													0
	Σ	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 8	87													0
	88													0
	Σ	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 9	87				793079				553969			336811		1683859
	88				697918	573731						199435		1471084
	Σ	0	0	0	1490997	573731	0	0	553969	0	0	536246	0	3154943
Σ	87	0	0	30308	906092	1254196	1288621	0	881035	0	128856	336811	5042	4830961
	88	0	0	28928	697918	1125901	845492	0	791065	0	122352	724579	4088	4340323
	Σ	0	0	59236	1604010	2380097	2134113	0	1672100	0	251208	1061390	9130	9171284

Table 6 : Number of projects accepted and aid granted in the different categories

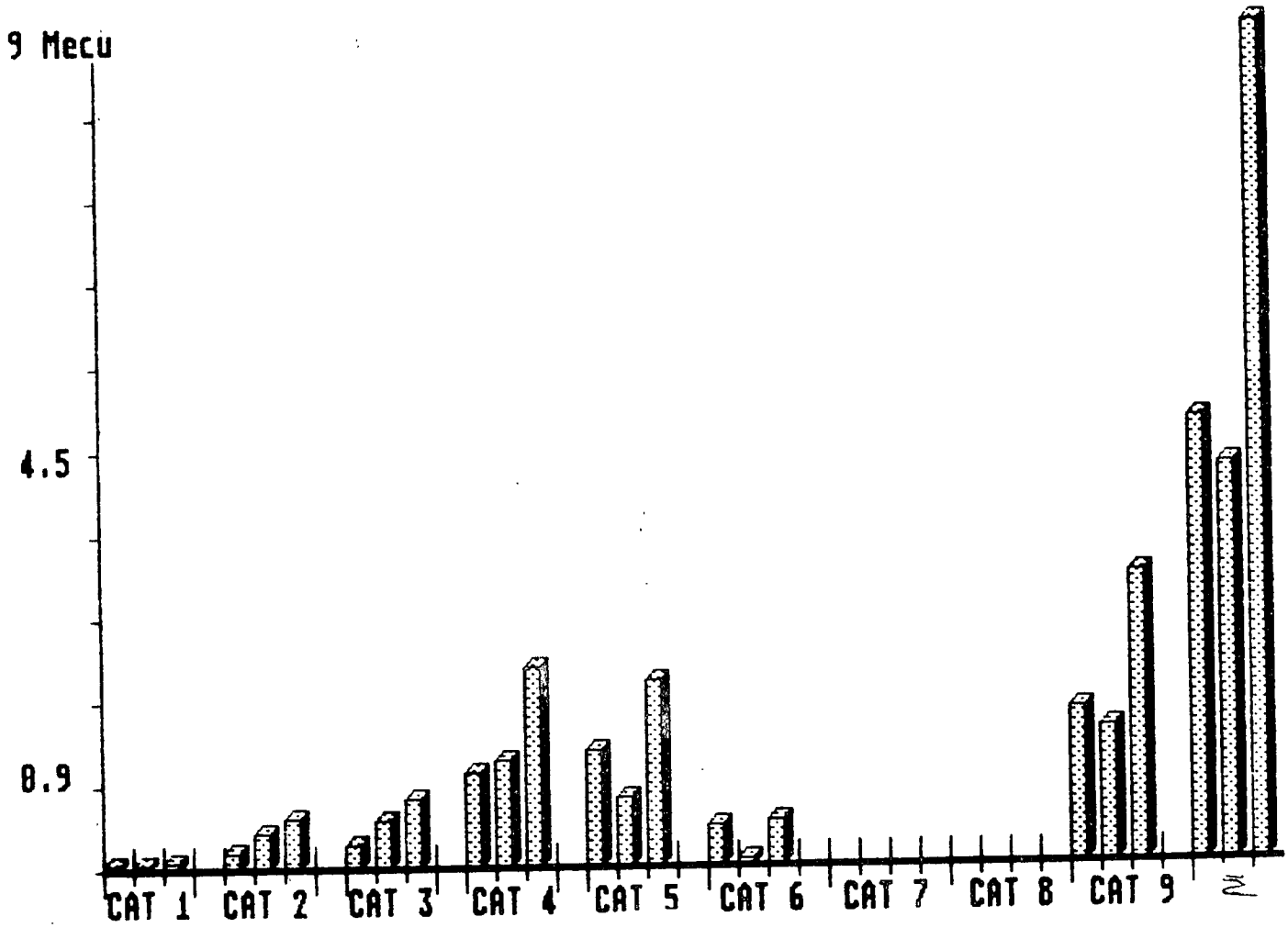

Figure 8 : Classification of projects in the various categories (in terms of financial volume)

An examination of this information shows that the multi-purpose projects account, in terms of financial volume, for 35% of the aid granted. These projects are concerned generally with the establishment of infrastructures, fire-watch facilities and information campaigns.

Next come projects concerned specifically with fire watch (21%), information campaigns (18%) and infrastructure (8%), while those concerned with data collection (4%), back-up measures (4%), the purchase of equipment and forestry operations (3.5%) elicit little interest. It is worth noting that the aid granted in the various categories exactly mirrors that requested by the Member States. The selection made by the Commission departments, on the advice of the Committee on Forest Protection, complied with the aims of the bodies responsible.

It emerges, therefore, that the projects provoking the greatest interest in the Member States, under Regulation (EEC) No 3529/86, are those dealing with the installaton of fixed or mobile look-out structures and with the running of information campaigns.

The former involve the installation or expansion of fire-watch facilities that will give the alarm as quickly as possible during periods when the risk of forest fire is at its peak. These facilities consist mainly of look-out towers for fire detection and warning, patrol vehicles in high-risk areas (equipped generally with facilities for fighting new outbreaks) and aircraft (planes, helicopters) to cover wide areas.

As a rule these facilities are linked with one another and with the competent authorities.

In the case of the information and public awareness campaigns in which Member States also show considerable interest, these are often the only way of reducing the damage caused by fire since many fires are accidentally caused and are due to a lack of awareness of the risks.

The campaigns are generally targeted at tourists, childern (in school or at holiday camps) and forestry and farm workers.

The provision of infrastructures, which comes third on the Member States' list of preferred aims, enables fire-fighting facilities to be used as effectively as possible. Aid for the construction of forest roads allows access to forests on which there is little or no return which were previously impenetrable. The creation of fire belts allows horizontal breaks to be made for arresting the spread of fire. These also allow access for the fire-fighting facilities to large stands which are ablaze, with the minimum of danger, enabling them to fight a fire once it has been contained. The provision of water supplies means that vehicles can be refilled regularly.

There is less interest in the purchase of brush-clearance equipment and in the establishment of interdisciplinary data-gathering centres.

Forestry operations involving the selection of species for reafforestation that are less susceptible to the risk of horizontal combustion within stands have fairly limited appeal. This type of action could, however, represent a long-term solution to the problem of limiting fire risk. It should be pointed out, however, that under the structural Regulations covering forestry, such as Regulations (EEC) Nos 1118/88, 2088/85 and 2052/88, Community funding for infrastructure and forestry operations may be granted on better terms for the beneficiary, meeting 50% or more of the cost.

Back-up measures covering mainly coordination and harmonization do not appear to interest beneficiaries greatly where only 30% of the project is financed. The responsibility for these essential measures would appear to lie with the Commission, which must take the lead in seeing that they are implemented.

On the whole, therefore, applicants are submitting projects relating to active fire prevention (fire watch and large-scale information campaigns) rather than long-term passive prevention projects (provision of infrastructure, forestry operations, training, harmonization, and so on).

II.4 Progress of work and payments made

Of the 88 projects accepted by the Commission for the two years of application of the Regulation, requests for payment were submitted in respect of seven by February 1989, involving a total of ECU 1 178 866. Most of these have not yet been completed. As a rule they take more than one year. In addition, since the Commission decisions on the projects were notified to the parties concerned in December 1987, work could not start until the beginning of 1988.

For the same reason a number of beneficiaries were unable to complete the work by the deadlines fixed in the decisions and are therefore requesting an extension of the implementation period. It should be noted also that 5% of the projects have not been completed because the public funds to top up the Community aid were not forthcoming in time.

III: EVALUATION OF SCHEME AND CONCLUSIONS

At the end of these two years of application of Regulation (EEC) No 3529/86 it can be seen that the southern European Member States, and to a lesser extent those of northern Europe, have shown a definite interest in the Community scheme to protect forests against fire.

The Commission has accepted 88 projects qualifying for Community funding of ECU 9 171 284.

It is too early yet to draw conclusions as to the effectiveness of the prevention measures implemented under Regulation (EEC) No 3529/86, since many projects are still in hand.
An examination of the type of projects submitted, shows however that active prevention measures (information campaigns and fire watch) are preferred to passive ones (infrastructure, forestry operations, training, harmonization, etc.).

It would be desirable in the future to request the Ministries concerned to give more priority, when submitting projects, to surveillance programmes integrated at national level, account being taken, of course, of specific regional characteristics. This new approach should help increase the effectiveness of the measures funded and would help ensure improved coordination at both national and Community level.

Furthermore, following the adoption by the Council on 29 May 1989 of Regulation (EEC) No 1614/89*, amending Regualtion (EEC) No 3529/86, Community support for the protection of forests against fire has been increased. The Community contribution has been raised form 30% to 50% and the funds set aside for the scheme have been increased from ECU 20 million to ECU 31.5 million. The new Regulation also provides that "The scheme shall also cover measures to encourage pilot projects and experiments in new techniques and technologies, and the development of equipment and products which may increase the effectiveness of measures to protect forests against fires".

After these two years, and in view of the new measures provided for in Regulation (EEC) No 1614/89, it would appear that there is a need for coordination and harmonization measures to be implemented in order to obtain a better awareness, and hence understanding, of the problems associated with forest fire.

* OJ No L 165, 15.6.1989

These measures must be undertaken by the Commission, which must act as instigator in view of the Community scale of their study.

In the legislative field, a comparative study of the Member States' legal systems and their impact on fire risk should reveal the benefits and drawbacks of each of those systems and suggest the measures to be taken to improve management of the risk.

The establishment of Community forest inventories, using remote sensing, for example, will enable the national inventories to be aligned and, hence, the inventories of forest fires, the monitoring of burnt areas and any changes that occur in them, etc.

A comparative study of national fire alert, fire-fighting and fire control systems and arrangements for the deployment and coordination of the various levels of authority (the degrees of responsiblity of the Ministries concerned, of the regions vis-a-vis the national authorities, and so on) will provide the necessary information for the improved management of forest fires and reveal the need, if any, for cooperation between Member States.

On a more technical level, the coordination of projects, the collection and dissemination of information, the harmonization of techniques, training, and the organization of scientific and technical exchanges will ensure that the measures undertaken are more effective.