

Anticipating Researchers Europe

C. Rizzuto, the Chairman of the Physics Panel of the CODEST committee that reviews applications to the European Union's Human Capital and Mobility programme, discusses what has been learnt about running an effective European programme in science.

The activities of the European Union's (EU) third Framework programme (F-III) are coming to an end for what relates to calls for proposals. It is now possible to start an evaluation of how the programme has been managed from the points-of-view of the scientific selection and administration. Indeed, a mid-term evaluation of projects selected in the programme's first year of operation is now under way.

Focussing on the Human Capital and Mobility (HCM) programme, let us briefly recall the activities. These are of five different types, namely networks, individual and institutional fellowships, access to large facilities, and Euroconferences (see insert). The largest fractions of the applications received and funds allocated related to networks and to both individual and institutional fellowships (for a total of 477 MECU over three years out of a total of 555.6 MECU for the entire HCM budget allocation). I shall therefore refer mainly to these three activities. Before trying to make a preliminary appraisal of HCM, by following the "flow chart" of successful applications to the three main activities, I shall first comment on the peer review system.

Scientific Review Undirected

The final attribution of grants for most EU programmes is made by the European Commission (EC) following deliberation by a regulatory or representative committee (called the Committee of Regulatory Nature, CRN) comprising representatives of the EU Member States. Only in the case of HCM, as well as in the previous SCIENCE and Stimulation programmes, have the deliberations always followed the recommendations of a scientific committee (called the Committee for the Development of European Science and Technology, CODEST). CODEST is composed of 25 scientists deliberating independently and not as representatives of states or institutions, and, in HCM, using the opinion of seven disciplinary sub-panels (with one for physics).

So the standards for selecting between proposals to HCM have been entirely in the hand of scientists. This is not the case for the standard and clarity of the calls for proposals, and for the administrative procedures following the scientific selection, which were outside the direct influence of CODEST.

Following a proposal put forward by the scientific panels and CODEST, a "feedback to unsuccessful applicants" was partially implemented, aiming at informing applicants of the main points in which applications could be improved if they wanted to re-apply. This proposal aimed at rendering the system more transparent and user friendly, as were the efforts by the panels to involve as extensively as possible, as "primary referees" of the proposals, all European researchers of high quality. These two lines of action should be pursued, hoping that the next Framework

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programme still leaves the selection in scientific hands (which is not to be taken *a priori*).

Concerning the scientific control of the selection of projects and fellowships, it seems that the panel system will be maintained, but that CODEST will no longer be involved in the detailed selection procedure. It has, in fact, been radically changed into a much larger body of scientific experts (about 100) called the European Science and Technology Assembly. This new body should, however, advise more systematically the Commission on all matters relating to the Framework and other scientific programmes, in contrast to CODEST which had slowly declined into committing itself only to basic, undirected science that does not have a very high standing in the EU.

CODEST Physics Panel

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A. Barroso, Lisbon*	A.T. Quintanilha, Porto
J. Borgman, The Hague*	H. Rauch, Vienna
N. Cabibbo, Rome*	M. Rees, Cambridge
M. Cardona, Stuttgart	M. Rice, Zurich
R. Cowley, Oxford	C. Rizzuto, Genoa (Chair)
E. Economou, Heraklion, Crete	G.A. Sawatzky, Groningen
O. Hansen, Copenhagen	B.E.Y. Svensson, Lund
C.J. Joachain, Brussels	P.C. van der Kruit, Groningen
M. Kaufmann, Garching	M.G. Velarde, Madrid
P. Kienle, Garching	M. Veysie, Paris
L. Kristjansson, Reykjavik*	M. Voos, Paris
L. Lugiato, Milan*	D.J. Wallace, Loughborough
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G. Parisi, Rome	D. Weaire, Dublin

*: CODEST member; *: replaced L. Maiani in 1993

Calls for Proposals Unclear

Calls for proposals were in all three cases rather misleading in that no clear definitions were given as to what types of applications the EC was expecting. This vagueness had as a consequence a very large number of applications with very diverse types of content (even when only taking those with a good scientific content). For networks, the amounts asked for ranged from a few thousand ECU to over 10 MECU, and the content ranged from a simple exchange of visits to fully-fledged infrastructure programmes. In individual fellowships, applications ranged from junior undergraduates without any documented scientific experience to senior researchers over 60 years of age, with stays ranging from a few months to three years. For institutional fellowships, applications ranged from entire universities asking for blocks of fellowships on any subject to a single professor asking for a support for a thesis student.

HCM Summary^a

	Allocation MECU	No. of contracts	Average contract KECU	Success rate ^b %
Individual Fellowships	249.5	1465	77	36
Institutional Fellowships		612	164	26
Networks	227.3	701	325	30
Large Installations	62.6	74	774	52
Euroconferences	15.0	289	50	49
Accompanying Measures	1.2	12	72	—

a) Data, except allocations, was provided in February 1994 and covers = 92% of the HCM budget total allocation in Framework III.

b) Number of successful proposals / number of applications examined.

HCM Activities

Individual fellowships. Based on applications submitted directly by scientists to the EC having identified the laboratory of their choice and with which the EC afterwards negotiates a contract for the training of the applicant. Calls for proposals are open continuously.

Institutional fellowships. Based on contracts with laboratories which submit applications and are selected by the EC. Each laboratory then obtains the EC's agreement on a list of young scientists who have been selected for training. Two proposals each year, one to host institutions and one to researchers.

Research networks. networks of five or more laboratories or teams in 3 or more EC member States. The EC contribution covers 100% of marginal costs. Expenses related to the researchers themselves amount to 60% of the total; the remaining 40% is to be used to research expenses. Calls for proposals are open continuously with three selection rounds.

Access to large-scale installations. For access to a major facility or to a group of smaller establishments with complementary capabilities. Two successive calls for proposals, the first seeking proposals from facilities along with an expression of interest from users. The second call is published with a list of successful facilities and seeks joint proposals from the facility and potential users. Effectively, the user must be initially selected by the facility. Of the EC contribution, 40% goes to the researcher and 60% to the institution.

Euroconferences. A series of high-level meetings at the cutting edge at which specialists meet young scientists. Calls for proposals open continuously and of the EC contribution, 90% is for the expenses of young scientists and 10% for administration.

Other aspects of the calls for proposals were also troublesome. For example, in fellowships, confusion between the concept of a fellowship and that of a permanent position was induced by the guidance notes referring to "social security" and rigid "national fees", which totally ignored the very diverse realities connected with different institutions or regions in a given country.

The underlying cause of the unclear calls for proposal arises from the fact that the reference framework is reached by consensus between conflicting political opinions. This can be overcome only by leaving room for conflicting interpretations of the rules and procedures.

Selection and Information Adjusted

The evolution of well-tested procedures and rules to indicate levels of funding took place during the first two selection rounds (in July-October 1992), starting from scratch owing to the need to run in the newly implemented panels. The composition of the panels (for physics, see insert) was made public, with some resistance from the Commission, at the beginning of 1993 and the quality can be judged by the reader. In the new Framework programme, it is intended to renew one-third of each of the panels each year. The use of external referees was implemented gradually, but it has been very difficult to educate referees to adopt standard evaluation and marking and phrasing systems. These would have eased the panels' final rankings of proposals by comparing referee reports as well as the feedback to unsuccessful applicants of useful, anonymous comments. Nonetheless, a reasonable situation was reached in the final selection rounds, although some improvements are still possible.

Considering the three activities. In networks, the main difficulty in deciding support was posed by the diversity of applications. The physics panel had to take certain decisions (see insert) which were shared by some, but not all, of the seven disciplinary panels. For fellowships, the main problems (e.g., covering different levels of social security payments in the various Member States) should hopefully be solved in the future by greatly simplifying contractual procedures.

In selecting fellows, the physics panel used as a main parameter the documented scientific activity of an applicant, in the light of the proposed project and host institution. This strongly limited the number of successful applicants of junior (pre-doctoral) age who could, however, be more easily evaluated at the institutional instead of at the European level.

Contracts Obscure

Let us now consider briefly the third step of a successful application: the contract. This step has been the most obscure and unsatisfactory: in some cases, successful fellows or networks did not have a firm notice, not to say the final contract, until several months after the final approval by the representative (programme) committee.

Two main causes have been put forward to me to explain these delays. The first arises from the fact that, in principle, every EU Commissioner has to approve any decision. Given the number of Commissioners (and the efficiency of their bureaucracies) this

could in principle require infinite time (especially if there are controversial decisions). The second cause seems to be connected with the detailed "legal" verification of each contract, which, if the relationships between different offices are not smooth, may entail further delays.

These delays, and the ensuing difficulty to give prompt and clear information, including the results of the scientific selection, is largely responsible for the EC's perceived "bureaucratic" approach. The HCM programme is managed by part of the Directorate General for science (DG-XII) and, in my

Networks Raised Special Difficulties

In the HCM "networks" activity, the rule for funding set by the EC was that 60% of the total amount for each network should be spent "on people" and only part of the remaining 40% (e.g., a deduction of 10-15% for overheads) on research-related expenses. As this meant that most of a grant should be spent either on visiting fellows or on travel, the requirements conflicted with the rather large budget dedicated to individual fellowships. In fact, the average probability of funding a network (even at the low level finally decided) turned out to be 32%; it would have been less than 10% for the higher funding sought by applicants. On the other hand, the success rate for funding individual fellows was over 30% in spite of some selection rounds having insufficient applications of good quality on averaging over all panels (although physics consistently had good applications). The same was true for institutional fellowships, if an "institution" was taken as a group of institutes with a reasonably large number of (good) senior researchers (i.e., on the order of 20).

The 60% rule was (unsuccessfully) contested very strongly by the physics panel because in a collaboration, especially in some experimental fields, the costs induced by hosting new researchers or by developing new activities, instruments, etc. can be very high. Unfortunately, this argument is not true for all disciplines (e.g., in engineering and the social sciences and in parts of biology and chemistry) where the "instruments" are professional people who can be engaged without prior specific activity. This is not the case in physics where a post-doc tends to be attractively employed only in his or her previous field of research. Finally, speaking of "money to people" has a strong political appeal as it implies that laboratory costs are the responsibility of the host country (the EU principle of subsidiarity).

The only reasonable choice, given these constraints, and that taken by the physics panel, was to support a network at a reasonable minimum level (about 25 ± 5 KECU per network node per year) the total cost of setting up collaborations, given the fact that 60% (i.e., about 12-15 KECU) could be spent on the people in a useful way (travel, short stays) without unduly enriching airlines and travel agencies. All longer stays (of scientifically valid people) could be accommodated in either institutional or individual fellowships (by suggesting to selected networks that they apply as institutions for fellowships). This "spread thin, but not too much" decision was applied to the selected networks and it has allowed the success ratio to be raised to the level of 32% mentioned earlier.

From a "science policy" point of view, the decision meant that we adopted an approach that sought to start as many links as possible between (good quality) European laboratories, leaving to them the initiative to further strengthen these collaborations by applying to the EC (fellowships, other programmes) and by asking their home institutions to be more generous towards activities conducted in European collaboration (subsidiarity!).

A first evaluation of this policy should now be possible by looking at the replies, which will arrive soon, to a questionnaire sent to a sample of the networks presently operating. It was CODEST which proposed such a study, based directly on a questionnaire, and the questionnaire will, in its final form, be sent to all networks.

Conclusions of a Mid-term Evaluation

A mid-term evaluation of the EC Human Capital and Mobility (HCM) programme by a panel of six chaired by D. Thomas, Professor of Molecular Biology in the Technical University, Compiègne, was completed in April (the final report will be published shortly). Appointed by the Director General of DG-XII from among independent experts and experts proposed by national delegates to the HCM Regulatory Committee (CRN), the panel consulted the Evaluation Unit of DG-XII, the CRN and the HCM management team. The main general conclusions were:

Overview

HCM has established itself as an important element in developing an increasingly integrated European science scene... Has had to cope with major difficulties which bequeath a legacy of operational haste (notably a launch date delayed by two years)... The management is widely credited with installing some strategy and a certain coherence.

EC Management

Few clear, explicit and agreed strategic objectives and criteria of success... Calls for proposal weak in reaching industrial laboratories... Selection criteria weak in evaluating cohesion and competitiveness factors... A *de facto* setting of objectives by CODEST panels, with operational responsibility diffuse... EC decision procedures after HCM selection are unnecessarily cumbersome for small contracts... The programme management is overworked.

General Objectives of the Council Decision

Could contribute more by having an efficient framework within which to operate... While contributing to reducing isolation of scientists in less-favoured countries, the cohesion requirements are poorly operationalised... Contribution limited by the lack of industrial involvement... Has provided added value, especially in networks, but except for large facilities, synergy with national programmes not yet obvious.

experience, problems cannot be blamed on the quality or the will of the staff, whose individual level of competence is good and in many cases very high. It includes a fairly large proportion of high-quality Ph.Ds in physics and other scientific disciplines who feel very motivated in growing a European "science space". The very low and sometimes very contradictory behaviour is connected to a fairly small number of senior staff who probably find themselves at the highly frictional interface between politics and efficient management.

It is this "tribological" layer which should be accurately evaluated and, I believe, encouraged to renew itself and evolve in a more efficient way with the help of strong "science policy" advice from European researchers. The need to evolve this capability has been felt and addressed by several organizations such as the European Science Foundation, the European Physical Society, the *Accademia Europea*, etc., all of which have been only partly successful in influencing the deve-

lopment of authoritative advice acceptable at one and the same time to the Commission, the Parliament and the Council of Ministers of the EU. Only when such a development has matured will one be able to overcome today's bureaucratic claddings, which hide the uncertainty of countries in developing a truly European science policy.

To conclude, I should point out that the quality of HCM applications was consistently very high and increasing in number. When we compared them from time to time, we found that most new applications were of a higher quality than the "reserve" applications (i.e., those ranked below excellent) which were carried over from one selection to the next. This indicates that the interest in the programme by good groups kept growing and involved more and more the European research community.

I naturally hope that, with the necessary improvements, a HCM-style programme will become a permanent feature of European science.

Cut-off dates: Individual fellowships, and Euroconferences — two selection cut-off dates each year; networks and installations — a single cut off each year. Calls will in each case be open continuously once they are announced.

Review system: DG-XII envisages a peer review system that is tailored to an activity as each has different requirements (networks are complicated, individual fellowships straightforward). Panels of about 20 people (with membership and chairs renewed at each call for proposals) would operate as EC committees. Appointed by the EC programme management after consulting the CRN, they would report to the EC and the CRN to ensure greater transparency and a more active EC rôle. Networks will probably have panels approaching the present seven CODEST disciplinary panels while fellowships, and maybe Euroconferences, may have several sub-panels. Installations, on the other hand, may have a single panel as splitting into disciplines is thought unnecessary when comparing facilities. By contrast, in HCM there is a uniform system review system with disciplinary panels of CODEST cutting across activities; CODEST then makes recommendations to the EC which are forwarded to the CRN.

Application forms: It has not yet been decided if application forms will continue to be of the complicated, machine-readable type available from Brussels, or simple forms that can be photocopied. In any event, readers of *RTD News* edited by the Information Services of DG-XII (fax: +32-2-295 82 20) may soon be asked to comment on a proposed form.

Programme guides: Guides will be more helpful and designed so that applicants can self-evaluate their proposals before dispatch to reduce the number of fairly poor-quality applications.

Eligibility criteria: oversubscriptions in some activities have been large (11-times for networks, reducing to 3-times for fellowships) so the idea is to try to limit the number of unsatisfactory applications by introducing additional eligibility criteria (e.g., to only fund networks in which research is carried out and not simply "clubs").

Information packs: Will probably be available for individual fellowships and networks (but not for installations and Euroconferences). They can be obtained once TMR starts by contacting H. Rosenbaum (fax: +32-2-295 6995) who will also send application forms on request. A computer-based self-loading application system has been studied, will but will certainly not be implemented for TMR.

Calls for proposals: To be announced in *Off. J (Series L)* on the 15th of December, March, June and September; first cut-off dates for selections are three months later (see above).

Further information: The Director General of DG-XII is Professor P.M. Fasella. The TMR Programme Director will be J.D. de Nettancourt, with P. Kind responsible for networks and installations and H. Rosenbaum for Euroconferences and general information. Annie Andrikopoulou will help with fellowships pending the appointment of a Head of Division to replace L. Bellemin.

Address: DG-XII, European Commission, 75, rue Montoyer, B-1040 Brussels (switchboard: +32-2-295 11 11).

HCM-bis May Drop Institutional Fellows

The European Parliament and the European Union's Council of Ministers reached agreement in March on the overall budget for the fourth Framework programme 1994-1998 (F-IV) in science and technology. The European Commission then adopted 20 specific programmes for which general proposals (see *EU Official Journal*, 18 May 1994) have been agreed by Council and Parliament. Detailed implementation is the business of individual programme committees (CRNs) when they draw up work programmes. The Parliament has already given some opinions on specific programmes, but the earliest decision by Council is 29 September 1994. A green light would mean that calls for proposals and details of the next calls for all the Framework programmes could be published in the *Official Journal* of 15 December. This follows a new practice introduced by A. Ruberti, the Commissioner for science, to improve information flow whereby details and calls will henceforth be announced in *Off. J. (Series L)* of 15 December, 15 March, 15 June and 15 September once F-IV begins.

One F-IV activity is the stimulation of the training and mobility of researchers (744 MECU over 4 years) which has as a major component a follow-on to the Human Capital and Mobility (HCM) programme, tentatively called Training and Mobility of Researchers (TMR). Under present EC proposals, it has the same annualised budget as HCM. A call on 15 December would mean a 15 March 1995 cut-off date for the first consideration of applications. If Council only decides at its December 1994 meeting then the call would be in March 1995 and the cut off in June. While specific dates to ensure three-month delays have advantages compared to the present Framework system of announcing

Commissioner Ruberti created earlier this year a European Assembly of Science and Technology to act as link between the EC and the scientific community. It will absorb the CODEST committee, and several bodies have been asked to nominate members. They include the European Science Foundation, Euratom, Accademia Europea, the federation of national science academies, CERN and other large facilities, industry, and national organizations.



calls whenever possible (even if this meant only a month's delay to submit an application), it could lead to a rush next summer if Council delays its decision until March 1995. The Directorate (DG-XII) responsible for science has discussed extensively how it would propose to run TMR, pending final decisions by the CRN. Here are a few indications of what is likely to emerge.

Activities: The EC's specific proposal does not envisage institutional fellowships, but it maintains individual fellowships in more-or-less their present (HCM) form, except for a stronger emphasis on postdoctoral training rather than Ph.D. studentships (Council may decide, however, to continue with institutional fellowships). Networks and access to large-scale installations stay pretty much in their present form, although the EC proposes fewer networks, each with a larger budget to offset the loss of institutional fellowships as the networks will be able to apply for fellowships. Euroconferences would aim to support mobility, new fields, irregular events (i.e., not series) and include applied topics. Some of the EC's ideas for implementing Euroconferences have met with a vigorous response, notably the proposal to allocate 75% of a grant for financing the participation of a young researcher, leaving only 25% for organization and, in particular, for supporting participation by experienced researchers from whom younger participants profit the most.



HCM logo. A call for proposals in a training and mobility programme to follow on from Human Capital and Mobility is not expected before 15 December 1994 at the earliest.