



# ***JPRS Report***

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# **Science & Technology**

***Europe  
Economic Competitiveness***

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# Science & Technology

## Europe

### Economic Competitiveness

JPRS-EST-91-006-R

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## SCIENCE & TECHNOLOGY POLICY

### EC's R&D Budget Audit Reviewed

91AN0218 Brussels EUROPE in English  
10 Jan 91 pp 13-14

[Article: "Research: The Court of Auditors Is on the Whole Satisfied With the Way in Which the 1989 Budget Has Been Used—Some Criticism of the Management of the Joint Research Centre"]

[Text] Brussels, 9 January 1991 (Agence Europe)—The annual report relating to the 1989 financial year of the Court of Auditors considers that, in the field of research policy, the budget has been satisfactorily used both from the point of view of the rate of utilisation of commitment credits and from that of payment credits. However, the Court notes marked underutilisation of credits carried over from 1988, because of the considerable fall in benefits achieved for third parties through the Joint Research Centre (JRC), on the one hand, and, on the other, delays in achieving contracts in the field of energy and the completion of former joint programmes. More in particular, the Court notes that certain sectors still have major "dormant" commitments. Such is the case for the European Strategic Programme for Research and Development in Information Technologies (ESPRIT), where it seems that, out of a sample range of operations which had not received any payment in 11 months, ECU5.8 million should have been paid.

More especially, the Court is examining JRC management in order to assess the progress achieved in the implementation of the main elements of the restructuring plan presented by the Commission in its "New JRC Perspectives" to which the Council rallied in June 1988. The Court points out that, although it is able to follow through certain recommendations made, at the end of 1989, by a team of businessmen having made a mid-term assessment of JRC, it does not however entirely share the conclusions regarding progress achieved. It mainly criticises the fact that, having reached the half-way mark in the 1988-1991 programme adopted by the Council in July 1988, the JRC is far from achieving its objective of increasing the volume of its provision of services to third parties, including the assistance supplied by the Commission, while spending related to specific programmes has exceeded what was originally planned further to the Council's wish to reduce JRC activity in this field.

The Court retains that the restructuring as it is inscribed in the "New JRC Perspectives" must be continued before it is possible to consider it as fully operational. At the end of 1989, the nine institutes still only had a reduced margin for manoeuvre for the management of their affairs. In the Court's opinion, if one wishes to achieve the fundamental restructuring objectives, it will be necessary to reinforce the autonomy and responsibility of institutes. A more commercial approach should be adopted towards operations between institutes and

there should be greater freedom of choice between the different services that they must provide. The institutes should also master personnel questions more effectively. This also means, in the Court's view, that the institutes should be more responsible for their results. For this, it would be necessary to draw up budgets and aims for each institute and to consider the directors as being charged with obtaining results.

As regards Commission aid, the Court proposes the setting up of a strict client-contractor relationship through modification of the financial ruling. In the meantime, a transitional system should be set up, thus rapidly encouraging the Commission's general directorates to give a clearer definition of the aims attributed to JRC research, so making its research more useful.

The Court notes, on the other hand, that performances as regards provision of services to third parties are well below the objective fixed (ECU6.92 million as against ECU14.629 million reckoned upon). This is particularly true for the six Ispra institutes. Certain institutes in the environment and remote sensing fields achieved unsatisfactory results in 1989, while it was hoped there would be wide appeal from third parties. The only satisfactory note: the Institute for Advanced Materials (mainly the Petten establishment), which signed contracts for ECU3.11 million while its financial objective was ECU2.53 million. Generally speaking, the Court cannot follow through the JRC statement according to which the goal fixed for third party benefits, in 1988 and 1989, was closely respected. Although the JRC insists upon liquid assets of ECU15.7 million, while the goal was ECU18.5 million, the Court refutes this figure as the amounts effectively coming in during this period were by way of ECU4.74 million. The Court believes that JRC has given a false picture of the reality.

Furthermore, the Court recommends JRC to continue its efforts to set up an accounting system that supplies a "profit and loss" account for each third party services contract. It notes that, because of certain conditions, it was not able to assess whether the contracts with third parties have always allowed cost prices to be covered. The Court thus considers it to be necessary, if the JRC is to substantially increase its third party benefits, to set up a professional marketing service. At the level of JRC personnel policy, the Court considers that the measures taken have hardly contributed to resolving the fundamental problems such as:

- a. Quality improvement of the Centre's scientific work;
- b. The lack of personnel mobility and the aging of personnel;
- c. The failure of qualifications to adapt to the Joint Research Centre's modified programme.

The Court proposes a review of recruitment procedures and employment conditions for new agents. It also calls for a study that will assess whether officials in the central

administration are assigned to appropriate tasks. Finally, the Court states that a "cost reduction division" should be set up to identify savings that could allow the JRC's competitiveness to be improved.

Concerning the JET (Joint European Torus) enterprise, the second subject analysed in greater detail, the Court recommends that a decision be taken as soon as possible on the deadline for the joint experiment. An extension of the project up to the end of 1992 was decided, but in October 1989 the JET council asked the Community Council for a further extension up to the end of 1996. As a decision has not yet been reached, two programmes must be conducted at once, one based on an expiration in 1992, the other on 1996. The project thus risks incurring useless and premature expenses.

### **Bangemann on EC's Aeronautics Industry**

*91AN0290 Brussels EUROPE in English 28 Feb 91 p 10*

[Article: "EEC/Aeronautics: Mr. Bangemann Considers the Discussions With the U.S. To Be a Failure—Recent Developments Highlight the Growing Need for Cooperation in the Aeronautics Industry in the EEC"]

[Text] Brussels (Agence Europe)—European Commission Vice-President Martin Bangemann, responsible for the internal market and industrial policy, this week met representatives of the European aeronautics industry. Europe believes that the following firms were represented at the meeting: Aerospatiale (France), Dassault (France), DASA (Germany), BAe (United Kingdom), Alenia (Italy), CASA (Spain), Fokker (Netherlands).

Mr. Bangemann discussed the factors that he believes have an influence on the development of the European aeronautics industry:

#### **The Failure of the Discussions With the United States**

Mr. Bangemann made it clear that in his view the attempt to seek an arrangement on aid to the aeronautics industry was unsuccessful. The United States is pursuing the procedure within GATT [General Agreement on Tariffs and Trade] and a first meeting in Geneva to examine the American request to set up a panel for this purpose will take place on Wednesday 6 March. At the same time, the Commission may continue seeking a multilateral arrangement for a new subsidy code, in accordance with the mandate received from the Council.

#### **The Fact That the Industry Operates in a Market in Which the Dollar is Used as a Reference**

This implies that any drop in the dollar causes a drop in the sale price of European aircraft in ECU's (or in national European currencies). It should be recalled that the German measure that is being disputed by the United States concerns exactly this problem, the covering by the German federal government of the exchange risk in the event of a drop in the dollar in relation to the mark.

### **The Reduction of Military Budgets**

"This latest phenomenon," Mr. Bangemann said, "can be considered a positive element that reflects the detente in East-West relations. It nevertheless requires companies in the sector to compensate for the reduction of military orders with more activity in civil aviation markets and a considerable human resource potential should be channelled towards civil programmes of common interest."

He said that the Commission is examining the possibility of providing support for the defence industry to facilitate its conversion to civil activities, particularly by stimulating technological research in areas where dual application is possible. The special Industry/Technology group of commissioners that Mr. Bangemann chairs has also set the objective of examining in depth the Commission's study of the industrial and technological aspects of Community policies and the possibilities of compensating in part for the shrinking military budgets.

Against this background, Mr. Bangemann noted, the airlines' recent disastrous financial results will not fail to have an impact on the aeronautics industry. In fact, the financing needs for the development of new products is growing exponentially, which implies greater cooperation among industry leaders in order to spread the risk and share technological know-how to limit costs and take full advantage of economies of scale, the vice-president added. Mr. Bangemann also stressed the need to maintain an R&D investment effort so as to preserve an adequate technological foundation. In this regard, he said it was vital to "lay down bridges" between R&D and the practical application of new technologies in the aeronautics industry: The definition and launch of a common interest programme are crucial, he concluded.

Mr. Bangemann then highlighted the possible role of the European Commission in this context: "Although it is obvious that the European Commission does not plan to take the place of those responsible for the aeronautics industry, a common approach as suggested by the Commission is of undeniable interest in the present circumstances." He recalled the main lines of action proposed at the Community level: the European public liability company, standardization, export credits, merger regulation, major trans-European networks and R&D. In reference to the latter, he recalled the effort to finance the current framework programme (aeronautics section of the BRITE/EURAM programme on the order of ECU70 million on the one hand and the proposal contained in the 1990-94 programme providing for the appropriation of some ECU100 million for the years 1992-1994).

EUROPE points out that the common approach to which Mr. Bangemann referred is the one proposed in the Commission communication of July 1990 which received support in principle from the Industry Council of last 15 December. Technical work has been continuing since that time and by next June the Commission

will have the conclusions of an exhaustive study of the competitiveness of the European aeronautics industry. According to available information, military activities presently represent around 45 percent of the sector's turnover, compared to 70 percent in 1980. European production features large overcapacity which makes it difficult to write off R&D expenditure.

#### **JESSI Chairman Assesses Program**

91AN0214 Brussels EUREKA NEWS in English Jan 91  
pp 4-5

[Interview with R. Paletto of SGS-Thomson Microelectronics and chairman of the JESSI Board: "JESSI Has Got What It Takes To Succeed"]

[Text]

**EUREKA NEWS:** Is the Joint European Submicron Silicon Initiative (JESSI) responsible for the speed-up in the development by European industry of the 16-megabit memory, now due for release next year?

**Paletto:** Yes, absolutely. If European semiconductor manufacturers are now convinced that they can meet this challenge, as well as that of the next step—the 64-megabit memory—it comes undoubtedly as a result of the launch of JESSI.

Of course, JESSI only took off just over a year ago, and it is too early to talk about "results" on the technological level. However, what is significant about this new tighter timetable for developing the new generation of memories, is that it shows that Europe is finally putting itself wholeheartedly behind the project.

For me, the really miraculous thing about JESSI is this: For the first time, this programme has succeeded in bringing about a revolution in the relationships between European electronics companies. Up until the early eighties, the industrialists in this sector saw each other as nothing more than competitors to be fought—but meanwhile all of them were losing ground. Today, they are at last all sitting round the same table to discuss what they can do together to save the European chip industry before it is too late.

**EUREKA NEWS:** Given the enormously ambitious nature of the programme, with a projected R&D budget of some ECU3.8 billion by 1996, the turn around seems to have been pretty decisive....

**Paletto:** You are right, but to get matters in perspective, it should be recognised that our budget barely matches the current spending of each of the three Japanese semiconductor "majors."

The size of the investment needed comes from the fact that the electronics industry has now become a completely interdependent system, a sort of closed loop. You cannot go on developing smaller and smaller chips without the raw materials and equipment to make them. Nor can you develop ever more powerful silicon-based

systems without understanding the applications which are going to use them. And, in order to make progress in each of these fields of electronics development, you need to carry out pieces of basic research which are themselves linked.

These four interlocking areas of the semiconductor industry—chip technology, materials and equipment technology, application technology, and basic research—make up the complex loop which JESSI comprises.

I should say that just to have built up this type of vertical cooperation is in itself quite a unique feat. To make JESSI work takes no small amount of management and consultation between the participants. Nevertheless it does work!

**EUREKA NEWS:** That is supposing that the rules of the game are clear and that, when the research does yield results, each partner will be able to profit from them....

**Paletto:** You have touched on a sensitive topic, that of industrial law. But it is also another of the successes that JESSI has notched up since its launch, and one that is an essential key to the programme's success. Last April, in fact, we managed to agree on clear rules, on both the technical and legal levels, for the ownership of the results, the granting of licences, and the transfer of information.

The agreement we reached, which serves as a basis for all the JESSI projects, provides for different levels of access to the results and their application, which depend on the degree of involvement in the programme. In particular, it distinguishes participants who can claim a right to full ownership because they were the source of the results from other participants in the same project, and also from those in other JESSI projects or subprogrammes. It also covers the possibility of transfer to other European partners taking part in microelectronics R&D programmes which the European Community is financing in parallel to JESSI.

**EUREKA NEWS:** Would you describe the launch phase of JESSI as an unqualified success? And now that it is safely in orbit, does it simply remain to harvest the results?

**Paletto:** Actually, I think that the response of European businesses has been quite remarkable. And one could say that, along with the industrialists and scientists who have agreed to involve themselves in the complex task of managing JESSI, we have done a good job.

Project proposals have flooded in above all expectations. From this impressive number, we have had to sort out the best ideas, and have often suggested partnership links. The result is that today JESSI is finely structured into more than 50 "kitemarked" projects, covering all the objectives that we have set ourselves.

Given this dynamism, the ball is now in the court of the European governments and the European Community

which have supported JESSI's launch. Given the importance of the programme's objectives, and the financial support that analogous programmes in America and Japan were receiving, a rule was fixed from the start whereby the costs that had to be borne to realise JESSI's objectives would be split equally between the public and private sectors.

In practice, in some countries, this mechanism has taken longer than expected to set up. The often very disparate national frameworks mean that it is proving laborious to coordinate a financial synergy between public and private contributions for each project.

I am tempted to make an appeal to accelerate things. In giving the active phase of JESSI the go-ahead in 1989, the governments concerned and the European Community have indicated the great importance they place on winning for Europe a new independence in the micro-electronics market.

It would be dangerous if this determination were to weaken, and if some politicians responsible were to hesitate and think of increasing their support for other objectives which appear more pressing, to the detriment of the strategic option that JESSI represents.

To take, for example, the problems posed by the environment, which I myself believe are very important, I do not think there can be a European ecological policy without the technological means to support it. Underlying all the constraints to which the European society of tomorrow will have to find an answer, the control of information technologies is the "hard core" which determines all the possible choices....

**EUREKA NEWS:** The microelectronics sector is frequently in the headlines as mergers and demergers excite media speculation. This year, for example, there has been the buy-out of the British company ICL by the Japanese giant Fujitsu, talk of cooperation between JESSI and its American counterpart Sematech\*, and of Philips backing out of component manufacture....

**Paletto:** I do not think you should confuse company strategy with the progress of JESSI. It is quite usual for firms to follow their own merger strategies, both within and outside Europe, which meet their commercial and financial needs. No one has the right to dictate to them what their decisions should be.

JESSI, for its part, intends to take European R&D efforts along a convergent path, to create the strong technological base which industry needs to assure its competitiveness. Of course the experience of JESSI must not be diverted from its goal, which is to serve the strategy Europe has chosen. But individual events such as the takeover of ICL must be judged on their own merits and not by rigid dogma. The golden rule for JESSI is to stay flexible.

It is not at all part of our philosophy to debar companies from entering into alliances: As in the case of our

agreements with the Americans in Sematech or the participation of IBM in several research projects, we judge that these cooperative activities offer us opportunities which allow us to advance towards our objectives.

As for Philips backing out, it only concerns a small number of the JESSI projects and in a very well-defined sector, that of static random-access memories (SRAMs). JESSI is not going to be held back as a result, nor will the participation of Philips. The Dutch company continues to be a major participant in several fields, and especially in applications linked to high-definition television (HDTV).

#### Footnote

\* Sematech is an inter-American industrial joint venture of the 14 main IC manufacturers aimed at developing materials and production equipment for semiconductor components.

#### European Chemical Industry Report Criticizes Biotechnology Competitiveness

91MI0201 Bonn *TECHNOLOGIE-NACHRICHTEN*  
MANAGEMENT-INFORMATIONEN in German  
18 Jan 91 p 13

[Text] New indications that Europe is falling increasingly behind in biotechnology are highlighted in a study published by the CEFIC (European Council of Federations of the Chemical Industry) Senior Advisory Group for Biotechnology and entitled "Community Policy for Biotechnology: Competitiveness and Economic Benefits."

This loss of ground is evident in both the number of new firms being founded and the quantity of patents. The study calls for coordinated European action to counter foreign penetration into basic sectors such as the pharmaceutical, chemical, and food industries, agriculture, and environmental protection.

The Commission of the European Communities also recognizes the significance of the arguments and statistics put forward in the report. In fact Community research accounts for only about three percent of the resources that the individual states invest in biotechnology. It is however true that the catalytic effect of cross-border cooperation, which has triggered progress in numerous areas of the life sciences, should also be taken into account.

The new specific life science and biotechnology programs that the Commission has proposed should take this progress considerably further. Nevertheless, the fact remains that an even greater investment, in terms of both personnel and financial resources, is needed in all fields, including intellectual property protection and regulatory measures, on which any boost for European biotechnology depends, if the Community is to catch up rapidly with other industrialized countries.

### **EC Sponsors German Mitsubishi Plant**

91AN0261 Amsterdam *COMPUTERWORLD* in Dutch  
30 Jan 91 p 22

[Excerpts] Paris (IDG)—For the first time in history, the European Community is to invest in a Japanese company. Aid amounting to 5.8 million European currency units (approximately 13 million Dutch guilders) will be granted to Mitsubishi for the construction of a components plant in Germany. The plant will start the production of 4-Mbit dynamic random-access memory chips (DRAMs) in 1992.

Recently, the EC seriously criticized Mitsubishi for dumping its semiconductors in Europe. This was happening at a time when the Joint European Submicron Silicon Initiative (JESSI) was in trouble. Philips' decision to withdraw from the program has put its partners, Siemens and the French SGS-Thomson, in a difficult position. [passage omitted]

With regard to the subsidies for the Mitsubishi plant, the EC proposes that the subsidy rules that apply to American firms should be extended to Japanese companies. Seventy percent of all semiconductors in Europe are imported from Japan. The decision provoked heavy reactions within European industry, but the Community sees no reasons for not giving subsidies. Every company with research facilities in Europe is entitled to subsidies, providing it complies with certain regulations. Subsidies had previously been granted to Motorola, which started up a factory in Ireland, and to an Italian subsidiary of Texas Instruments.

### **France: ANVAR Increases Aid to Industry in 1990**

91WS0182B Paris *LE MONDE* in French  
9 Feb 91 p 22

[Brief: "ANVAR [National Agency for Valorization of Research] Granted 1.415 Billion Francs in Aid to Innovation in 1990."]

[Text] The National Agency for Valorization of Research [ANVAR] increased the total of its grants to industry during 1990. This total came to 1.415 billion francs [Fr] last year, up 6 percent over 1989. Most of this sum (Fr1.022 billion) went into support of specific programs. The remainder was distributed in the form of grants for the hiring of researchers, technology transfers, and use of services in support of innovation. Two sectors alone received almost two thirds of the grants in support of specific programs: electronics and data processing.

### **ANVAR 1990 Industrial Innovation Subsidies Detailed**

91WS0218A Paris *AFP SCIENCES* in French  
14 Feb 91 p 1

[Unattributed article: "1.41 Billion Francs in ANVAR Subsidies to Companies in 1990"]

[Text] Paris—National Agency for Valorization of Research (ANVAR) granted 1.41 billion French francs [Fr] (compared to 1.33 in 1989) in innovation subsidies, "in keeping with the priority given by the government to innovative companies and to industrial research," reported ANVAR chairman, Mr. Henri Guillaume. "The Agency continued its policy of partnership with the local organizations, public institutions, and venture fund companies," he pointed out.

New products, such as subsidies for European technological partnerships within the framework of the Eureka program, and subsidies for dissemination and transfer of technology, were also put in place in 1990 and "have already borne fruit." Some Fr2.9 million in particular were allocated for transfer operations from one laboratory or from another company, and 35 European partnership applications were accepted last year, for a total of Fr15 million.

Also, 440 researcher positions, for a total of Fr80.2 million, were supported last year by ANVAR, which announced in September the one thousandth appointment obtained thanks to innovation subsidies. The sectors involved varied little from 1989: Electronics, computer science, instrumentation, and agro-foods continue to hold the lead in the numbers of applications accepted. In 1990, robotics engineering came in third in the amount of subsidies granted.

In 1991, ANVAR hopes to maintain its strong involvement with small companies, continue its action with new companies, intensify it in favor of medium-sized industries, and underscore the efforts of the traditional sectors toward the small and medium-sized industries. To better understand the needs of the companies involved, ANVAR also commissioned a market study. For all the clients polled, the three fundamental needs are financing (90 percent), know-how (56 percent), and contacts (44 percent).

### **France: CNRS Commission Restructured**

91WS0215A Paris *AFP SCIENCES* in French  
21 Feb 91 pp 1-2

[Unattributed article: "Restructuring of CNRS National Committee for Scientific Research"]

[Text] Paris—Anticipated for a year, the restructuring of the National Committee for Scientific Research, part of the modernization of the National Center for Scientific Research (CNRS), began 19 February with the publication in the *OFFICIAL GAZETTE* of two decrees and two orders referring primarily involving the redrawing of the boundaries of the sections of the committee.

This restructuring project, which was discussed, debated, "reviewed, and corrected" during the course of the past year by the head of the CNRS, Mr. Francois Kourilsky, was finally adopted by the board of directors on 30 January 1991. As the CNRS pointed out in a communique, this is the outcome of deliberations about the



economic report (1990-1992) concerning the situation of the sciences and its forecasts, and again during discussions organized at the time of the committee's plenary session in February 1990.

Although grounded in a "decompartmentalization of the modes of scientific organization" and "the fluidity of interdisciplinary exchanges," over the past year this project aroused the anxiety of researchers, particularly with regard to the redrawing of the boundaries of the sections of the committee and their reduction in number, along with the decrease in the number of members: It was, affirmed the trade unions in January, "the entire role of evaluation of researchers and laboratories which was being challenged." The Ministry of Research and Technology also asked the directors of the CNRS to "revise their copy" several times before the decrees and orders were published.

The National Committee will now consist of 42 sections (40 sections responsible for one or two scientific departments and two interdisciplinary commissions dealing with the upgrading and management of research), replacing the 49 which formerly constituted it, specifies one of the two orders from the Minister of Research and Technology. This list ranges from "Mathematics and Modelling Tools" to the section "Politics, Power, Organizations" and includes such sections as "The Solar System and the Distant Universe," "Plant Biology," and "Ancient and Medieval Worlds."

Just over one-fourth of the sections are devoted to the social sciences, with the remainder reserved primarily for mathematics, physics, and biology. The restructuring of the Committee will be rounded out by the establishment of three scientific committees for physics, biochemistry, and the oriental sciences. The objective of these committees, to be chaired by the head of the CNRS, will be "to reinforce the indispensable coordination across the boundaries of the scientific sections and departments," points out the CNRS.

The role of these sections involves evaluation of laboratories and researchers (partially determining their career advancement within CNRS), scientific policy advice for the CNRS, management advice relative to laboratory resources, both personnel and equipment, and, finally, human resources (promotions, researcher recruitment, aid to researchers and to laboratories).

According to the first decree, the sections of the Committee each consist of 21 members (compared to 22 formerly). Fourteen members are elected by electoral colleges made up of CNRS directors and research leaders, members of the Academies of Inscriptions, Humanities, Science, and Political Science and Ethics, CNRS research managers, research managers from public institutions other than the CNRS, and the engineers, technical personnel, and administration (ITA) of the CNRS.

Seven other qualified individuals are appointed by the Minister of Research, after recommendation from the

head of the CNRS. The term of a committee member—elected or appointed—is four years, renewable once. The second decree deals with the functioning of the sections and the second order governs the organization of elections.

#### The 42 Sections of the National Committee

1. Mathematics and Modelling Tools
2. Physical Phenomena, Theories and Models
3. Nuclear Particles
4. Atoms and Molecules—Optics and Lasers—Hot Plasmas
5. Condensed Matter: Organization and Dynamics
6. Condensed Matter: Structures and Electronic Properties
7. Information Sciences and Technologies (Computer Science, Automation, Signal Processing)
8. Electronics, Semiconductors—Photonics—Electrical Engineering
9. Mechanics—Materials Engineering—Acoustics
10. Energy—Mechanics of Fluid and Reactive Media—Process Engineering
11. Planet Earth: Structure, History, and Evolution
12. Planet Earth: Surface Mantles
13. Geophysics and Geochemistry
14. Solar System and the Distant Universe
15. Complex Molecular Systems
16. Molecules: Synthesis and Properties
17. Molecules: Structures and Interactions
18. Transition Elements—Interfaces and Catalysis
19. Elaboration, Characterization, and Modelling of Solids
20. Biomolecules: Structure and Mechanisms of Action
21. Biomolecules: Structure-to-Function Relations
22. Therapeutics and Medications: Concepts and Means
23. Genomes—Structures, Functions, and Regulations
24. Cellular Biology—Viruses and Parasites
25. Cellular Interactions
26. Life and Regulation Functions
27. Plant Biology
28. Developmental and Reproductive Biology
29. Mental Functions—Integrative Neurosciences—Behaviors
30. Biological Diversity—Populations—Ecosystems and Evolution
31. Humans and Surroundings: Evolutions, Interactions
32. Ancient and Medieval Worlds
33. Formation of the Modern World
34. Representations—Languages—Communication
35. Philosophical Thought—Textual Sciences—Artistic, Scientific, and Technical Creation
36. Sociology—Norms and Rules
37. Economics and Society
38. Human Uniformity and Cultural Diversity
39. Spaces, Territories, and Societies
40. Politics—Power—Organizations

Two Interdisciplinary Commissions:

- Economic, Social, and Cultural Upgrading of Research
- Management of Research

**France: State Aid to Aviation, Electronics Firms Discussed**

91WS0214A Paris LE MONDE in French  
22 Feb 91 p 25

[Article by Eric Le Boucher: "State-as-Shareholder Seeking Funds To Bolster Aeronautics and Electronics"; first paragraph is LE MONDE introduction]

[Text] Funds are becoming scarcer at a time of increasing need. Although the state has just decided to appropriate 2 billion francs [Fr] for Air France, financing the nationalized companies has never been more difficult than in 1991. The economic downturn and the Gulf War will reduce available funding. At the same time, the state-owned groups need additional financing to compensate for shrinking markets and resources.

Debate on the government's industrial policy (LE MONDE 21 Feb) is focusing on one issue: appropriations for nationalized companies. These appropriations give rise to harsh confrontations each year. This time, however, certain groups are in enough trouble that arbitration poses problems of strategy. Is it possible to pinch pennies on managing the public sector and expect it to be the "spearhead" of national industry?

From the resource standpoint, the arithmetic is not simple. The 1991 budget earmarks Fr4.7 billion for appropriations to state-owned companies in the competitive sector. This sum is supplemented by a balance of 2.5 billion left over from 1990, for a total of 7.2 billion. However, this total will be shaved by the budget ministry as part of its general effort to achieve the announced savings of Fr12 billion to finance the war. Around 400 million will be eliminated, leaving 6.8 billion.

More is needed. Around Fr700 million are required for the radio and television companies (A2 [Antenna 2], FR3 [France Radio 3], SFP, and [Channel] Seven), which are being funded under this heading for the first time. And then there are the 200 or 300 million for the employment-basin conversion companies. At the urgent request of the prime minister's office, and despite the opposition of the ministries of finance and industry, Air France will also get Fr2 billion from the same source. The appropriation was officially announced at a meeting of the board of directors on Wednesday, 20 February.

This leaves less than Fr4 million francs for the industrial groups. Fortunately, the requirements of the banks and insurance companies will not be met by appropriations. Instead, they will be given stock—as they have been for the past three years. These companies recover stock

formerly held by the state, exchange shares among themselves in complex financial transactions, and acquire interest in the capital of the industrial groups.

This game is highly contested by the opposition, which sees in it the failings of a "capital-less capitalist" state. Each move adds another link in a network financial relations interconnecting the entire public sector. The general philosophy of this network is hard to detect. For example, GAN was given CIC [Consulting Engineers Company] and a fraction of the capital of CFP-Total [French Petroleum Company-Total]. BNP [National Bank of Paris] inherited Bank of Brittany, plus stock in Pechiney, and carried out a 10 percent stock swap with UAP. Credit Lyonnais received funds from Caisse des Depots, a 50-percent interest in Thomson-CSF Finances, and Rhone-Poulenc stock. This list is incomplete and should grow this year.

So the remaining 4 billion will be used to finance the two industrial sectors that cannot develop without enormous technological research: aeronautics and electronics. It will be impossible to do anything elsewhere, whether for Renault (true, Brussels, would probably prevent it), for the troubled EMC, for Rhone-Poulenc, or for Usinor-Sacilor, even if this group will have to restrain its appetite for foreign acquisitions, owing to a lack of capital.

On the one hand, Aerospatiale and SNECMA [National Aircraft Engine Research and Manufacturing Company] (aircraft engines) have been hit hard by the fall of the dollar. On the other, Bull and Thomson need to finance research crucial for their future at a time when their profits have disintegrated. Mr. Francis Lorentz' group will announce losses of between Fr5 and Fr7 billion, and that of Mr. Alain Gomez will run a 200-to-300-million deficit for its TCE [Thomson Consumer Electronics] subsidiary (consumer electronics)—which will mean a debt burden for the entire group. Thomson will show scant profits or, some fear, even losses for 1990.

The decisions on the distribution of the appropriations have not yet been made. However, the best the state will be able to do will be to allocate a scant billion for the two aeronautics firms. Thomson will receive appropriations of 2 billion under the multiple-year contract signed last year to finance HDTV [high-definition television]. This plan calls for the group to receive Fr3 billion in research assistance between now and 1995 and an annual Fr2 million in capital allocations in 1990, 1991, and, probably, 1992.

**Recapitalizing Bull**

How much will be left over for Bull? The computer group's difficult case should be decided next week. It should receive a multiple-year package similar to Thomson's: 2.5 to 3 billion in assistance for its research program—which costs it 11 billion every four or five years—and annual allocations of 2 billion over a several-year period. The 5 to 7 billion in losses will completely exhaust the group's capital, and it will have to be

"recapitalized," if only to comply with corporate law. However, owing to the lack of resources, this cannot be done all at once (as was the case for Renault—and much the better option). In any event, funds will be lacking. The banks and insurance companies will be asked to provide around Fr1 billion in exchange for future stock contributions. This money will probably go to aeronautics. This type of operation has been used extensively over the past few years and has made it possible to "recapitalize" ELF [Gasoline and Lubricants of France], Pechiney, and Rhone-Poulenc. However, it will not work with TCE and Bull, which are losing money. These companies can look only to the state. In demanding that Air France feed from another budgetary trough, the ministries of finance and industry were on the same wave length; they wanted to reserve these funds for TCE and Bull. Mr. Rocard decided otherwise.

The two ministries are also asking the prime minister to force France Telecom to finance the electronics sector or, at least, to follow the increases in Thomson's and Bull's capitalization with contributions equal to its current 17-percent interest in each. Having just received a charter theoretically providing it with greater budgetary independence, France Telecom is refusing to pay the approximately Fr700 million francs that this represents.

The debate over the 1991 budget is strategic. In aeronautics, the Germans, Japanese, and, of course, the Americans are stepping up the offensive. It will not be possible to strike back for long without massive support. The same is true in electronics. Everybody agrees that a link must be found between telecommunications, computers, and HDTV. And while embryonic, there is also some discussion on restructuring the "French electronics sector." However, one must admit that the context has been simplified.

European hopes in this sector have faded to almost nothing. The British firms are gone. Philips and Olivetti are in trouble. Siemens is a fortress that apparently would rather ally itself with Fujitsu or IBM. What is more, the European programs are going nowhere. In short, whether in aeronautics or in computers, if France wants to stay the race, it must above all rely on itself. We cannot deceive ourselves as to the order of magnitude of the funds required to do so: tens of billions of francs.

### **France Telecom To Run National Research Network**

*91WS0189A Paris AFP SCIENCES in French  
7 Feb 91 p 17*

[Text] Paris—The French ministers of research and technology, national education, and posts and telecommunications signed an agreement protocol on 5 February to implement the National Telecommunications Network for Research, which will be operational in 1992.

At the request of the three ministries, France Telecom will be chief contractor for the network, which will be

geared toward all research organizations and the universities. The public company will also perform the engineering study after completion of a needs analysis, then set up and operate the network. The study should be completed next June.

"This network meets a demand expressed by all the technicians and researchers in our country," stressed the minister of research, Mr. Hubert Curien. "It will be a gigantic data bank and a unique computing tool for French research."

The network will make it possible to facilitate collaboration and transfers of knowledge, through: national and international electronic mail; files; access to large data bases; enormous computing power; gathering, exchange and collection of results; etc. Graphic documents and pictures will also be useable from a distance.

With its large-band, 100-megabit network (compared to 64 kilobits for the Numeris network) "it will also be an opportunity for experimentation, and a forerunner for the integrated-services digital network that we will have at the end of the century," said the minister of telecommunications, Mr. Paul Quilès.

The network will cost about 30 million French francs a year over three to five years, according to a France Telecom estimate, and will be made up of the 15,000 computers and work stations now used in research. Already existing campus and regional networks will also be linked to it.

### **Atomic Energy Commission To Transfer Technology to Industry**

*91WS0182A Paris AFP SCIENCES in French  
31 Jan 91 p 1*

[Article: "Agreement Reached To Disseminate AEC Technologies to Small and Medium-Sized Businesses"]

[Text] Paris—The Atomic Energy Commission [AEC] has signed a memorandum of agreement with the General Confederation of Small and Medium-Sized Businesses [CGPME] and the Small and Medium-Sized Business Equipment Financing Fund [CEPME] to foster the dissemination of technologies developed in its laboratories and subsidiaries to small and medium-sized businesses [PME] and industries [PMI]. The CGPME includes some 500,000 PME-PMI firms.

Under this agreement, the AEC will make available to its partners all general information on its technologies, which the CGPME will disseminate to its member firms. The CEPME, for its part, will offer to the PME-PMI's financing plans specific to the commitments they undertake jointly with the AEC.

In addition, a National Steering Committee has been created, as an information and exchange structure, to foster and support the regional action already initiated by the AEC through its participation in the regional

technology dissemination networks, together with the National Agency for Valorization of Research [ANVAR].

This agreement on a national scale, furthering the AEC's comprehensive policy in support of the PME-PMI sectors, will be followed by regional agreements implementing this policy and spelling out the practical aspects of its operability. The first of these agreements has been signed by the AEC's Scientific and Technical Research Center at Aquitaine [CESTA].

### German Research Minister Favors Joint R&D With Japan

91MI0240 Duesseldorf *HANDELSBLATT in German*  
11 Mar 91 p 9

[Excerpts] At the end of his talks with Korean and Japanese government officials, Federal Minister of Research and Technology Heinz Riesenhuber called on German industry to strengthen its competitiveness by both manufacturing and carrying out research and development in Japan. They could even participate in state research projects, thereby taking the offensive in exploiting the strategies and technologies being developed by the Japanese. [passage omitted]

According to Riesenhuber, while in Japan he had paved the way for an expansion of the range of German-Japanese joint research projects. An agreement on bilateral scientific and technical collaboration has been in existence since 1974. However, talks with the Japanese currently focus on various joint international research projects:

- The construction of a nuclear fusion plant for power generation: Besides Japan and Europe, the United States and USSR are also involved. A working party was set up in Germany for the concept development phase, which has now been completed. The Japanese have expressed the desire to host the next phase, which will be devoted to fusion equipment engineering and design, in Japan. Talks on where the work will be continued will take place shortly. Riesenhuber made it clear in Tokyo, however, that there was strong interest in keeping the team in Germany, which is also fighting French, American, and Japanese competition to have the plant built in Karlsruhe. The overall project has a 10 billion German mark [DM] budget.
- The Human Frontier science programs (including genome analysis and brain research): Riesenhuber said that the project, instigated by Japan, had grown into an attractive international division of responsibilities for all participants, with various priority areas. The initial Japanese intention had been to recover lost ground in biotechnology.
- Basic research: Although the level of overall R&D spending, equivalent to 2.9 percent of the gross national product, is similar in both Japan and Germany (the old Federal Republic), Riesenhuber says

that Germany still invests considerably more in basic research. Thus, spending on basic research accounts for 19 percent of total R&D costs in Germany, as opposed to only 13 percent in Japan.

During his talks with the Japanese Ministry of Economic Affairs (MITI) in particular, Riesenhuber called for integration of individual strategies at the international level to overcome central problems, such as the greenhouse effect. While he was in Tokyo he also asked Japan to adopt German CO<sub>2</sub> emission reduction targets. The main priority, however, was international coordination in applying existing technologies and the further development of processes that will bring this target appreciably closer.

Another issue discussed with MITI was long-term scientific strategy in industry. Riesenhuber emphasized that only the creation of German R&D facilities with their own research staffs in Japan would make Germany eligible to become an insider and to take part, for example, in MITI projects. There was already a substantial involvement on the part of the German chemical industry, and Daimler-Benz and Siemens were beginning to think along similar lines.

Stressing that a strategy of cooperation and competition must be pursued, Riesenhuber quoted as an example the European JESSI [Joint European Submicron Silicon Initiative] project on the development of the 64-megabit chip, which will also create links between Europe and other continents. Europe must acquire a strong independent position in this technology and not rely on its strongest competitors. This would be dangerous, insisted Riesenhuber, referring to the German mechanical engineering industry's experience at the beginning of the eighties, when companies could not obtain the most advanced chip generation, which was already available in Japan, owing to a supply embargo.

### Germany: East To Participate in BMFT Materials Research Program

91MI0199 Bonn *TECHNOLOGIE-NACHRICHTEN*  
*MANAGEMENT-INFORMATIONEN in German*  
18 Jan 91 pp 6-7

[Text] The Federal Ministry of Research and Technology's materials research program, which has an overall funding budget of 1.1 billion German marks [DM] over its 1985-1994 term, has attracted considerable interest in industry and institutes in the new FRG Laender. In particular, the concept of joint research between industry and scientific institutes, which has been extraordinarily successful and fruitful since 1985, has proved an ideal criterion for funding here as well.

The beginning of 1991 saw the start of 40 joint research projects under the materials research program, with partners from the old and new FRG Laender working together on innovative materials research topics. DM16.8 million have been granted to the partners in these projects based in new FRG Laender. Of this sum,

DM8.5 million go to industrial partners, which are also contributing a further DM5.6 million out of their own resources. The scientific, i.e., university and former Academy of Science, institutes will receive the remaining DM8.3 million.

Intensive networking of all German research structures engaged on materials research has been achieved via a series of informative events that have been taking place in the new FRG Laender since March 1990. Scientists and industrial companies were invited to draw up their ideas and proposals in the form of outline projects. The resulting 700 or so proposals and outlines received in the second half of the year were considered with the assistance of experts, and the projects eligible for subsidy measures beginning in 1991 were selected. Preference was given to projects showing not only technical quality as determined by the experts, but also viable structures for cooperation between industry and institutes. The following are examples of the joint projects subsidized:

- Development of materials for nonlinear optic and photovoltaic applications. Partners: Wacker Chemie, Burghausen; University of Jena;
- Development of multiphase polymer blends using new kinds of gradient graft copolymers for use as high-polymer construction materials. Partners: Buna AG, Institute of Polymer Technology, Dresden; Institute of Materials Research and Application Engineering GmbH, Dresden; Merseburg Institute of Technology, Central Institute of Organic Chemistry, Berlin;
- Modification of high-speed steel powders for the production of semifinished precision components by metal powder injection molding. Partners: Krebssoege Sintered Metal Works, Radervormwald; Thale AG Ironworks; Technical University of Dresden; Mining Academy, Freiberg;
- Dispersion ceramics based on aluminum oxide—titanium carbide—zirconium oxide. Partners: Robotron, Dresden; Central Institute of Solid-State Physics and Materials Research, Dresden; Hermsdorf Ceramic Works.
- Investigation of the absorption mechanisms of real glasses in the ultraviolet range, exploration of the deep UV range with new optical glasses, and environment-friendly refining mechanisms for reducing molten special glasses (DUV glasses and refining). Partners: University of Jena; Jena Glass Works;

Schott Glass Works, Mainz.

Additional information, particularly on further subsidy measures under the materials research program, may be obtained from Dipl.-Ing. Faul, Materials and Raw Materials Project Management Office (PLR), Juelich Research Center GmbH, P.O. Box 19 13, 5170 Juelich. Tel. 02461-614891.

### German Research Budget for 1991 Drafted

91MI0255 Bonn *TECHNOLOGIE NACHRICHTEN*  
MANAGEMENT-INFORMATIONEN in German  
28 Feb 91 pp 2-5

[Text] With a total expenditure of 8.4 billion German marks [DM], the 1991 federal research budget is set at 6.8 percent more than the 1990 projection of DM7.867 billion (excluding the BMFT [Federal Ministry of Research and Technology] budget). In its recently submitted draft budget, the Federal Government lists research expenditure in the old and new laender together for the first time. "Limited room for finance policy maneuvering in the coming years must be offset by maximum flexibility and creativity," said Research Minister Riesenhuber in Bonn.

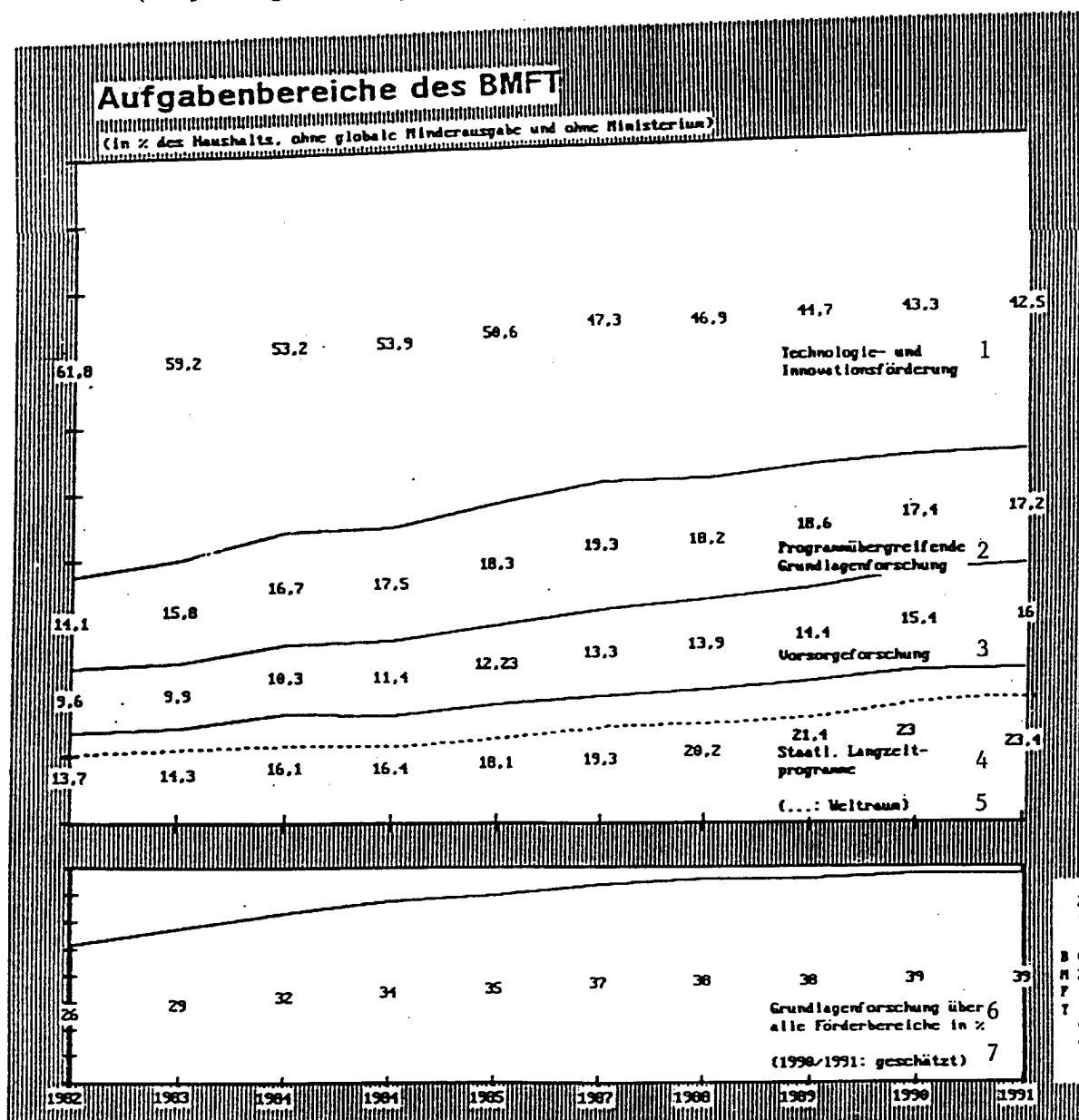
The Federal Government's share of the DM450 million transitional funding for the former Academy of Sciences institutes is set out separately in individual plan 60. According to Riesenhuber, the transitional funding covers a key political priority by providing the finance to restructure research in the new laender, which was previously centralized and ideologically oriented, by dismembering the Academy of Sciences. Including transitional funding for the academy of Sciences, research and development falling within the BMFT's terms of reference in the new laender will have more than DM1 billion in support in 1991. This extra spending will not merely be financed out of the budget increase. Scope for research and development in the new laender will have to be created by very strict economies in all areas of research policy. With maximum flexibility, careful budgeting, and exploitation of synergies in major research and project funding, research in the old laender will make its contribution to the future of the new laender.

The research budget is divided into the following fields: technology and innovation funding (1990-1991 increase: five percent), interprogram basic research (1990-1991 increase: six percent), preventive research (1990-1991 increase: 8.9 percent). As in 1990, it is under an obligation to cut overall spending, and DM250 million will consequently be saved when the budget is finalized.

**BMFT-DAFIN Overview—18 February 1991**  
**Major Increases and Cuts in the 1991 Draft as Compared With the 1990 Budget**

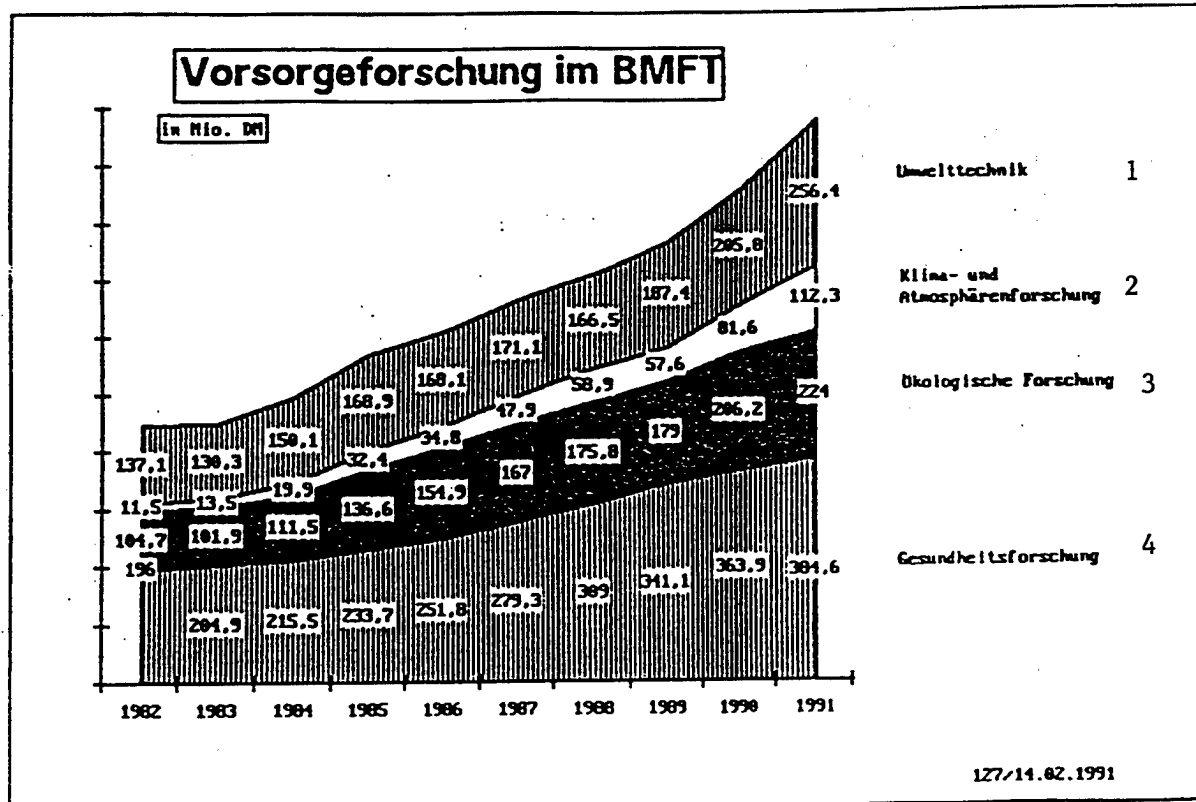
Funding Area/Funding Program	Excluding Major Research Facilities				Including Major Research Facilities			
	1991 Projection DM Millions	1990 Projection DM Millions	Variations in DM millions	Variations as Percentage	1991 Projection DM Millions	1990 Projection DM Millions	Variations in DM Millions	Variations as Percentage
Basic financing Max Planck Society	509.5	471.0	38.5	8.2	509.5	471.0	38.5	8
Basic financing Fraunhofer Society	180.3	164.4	15.9	9.6	180.3	164.4	15.9	9
Large-scale equipment for basic research	476.5	439.0	37.5	8.5	974.6	929.5	45.0	4
Marine research	104.0	113.2	-9.2	-8.2	112.8	120.8	-8.0	-6
Polar research	11.0	8.0	3.0	37.5	68.2	57.0	11.1	19
Space research and space engineering	1,401.2	1,258.6	142.6	11.3	1,559.5	1,419.1	140.4	9
Coal and other fossil fuels	136.0	141.5	-5.5	-3.9	146.0	151.1	-5.1	-3
Renewable energy sources and rational energy consumption	288.0	265.0	23.0	8.7	321.8	296.6	25.3	8
Nuclear energy research (including reactor safety)	345.3	309.7	35.6	11.5	600.9	614.4	-13.5	-2
Environmental research, climatic research	322.3	266.9	55.4	20.8	592.7	493.6	99.0	20
Health-related research and development	186.9	174.9	12.0	6.9	384.6	363.9	20.7	5
Information technology (including manufacturing engineering)	658.6	597.8	60.8	10.2	882.1	818.1	64.0	5
Biotechnology	215.3	194.9	20.4	10.5	273.8	252.4	21.4	8
Materials research	136.3	124.6	11.7	9.4	257.0	231.9	25.1	12
Physical and Chemical technologies	172.8	159.2	13.6	8.5	256.2	237.7	18.5	7
Earth sciences (deep drilling in particular)	75.0	61.0	14.0	23.0	76.6	62.4	14.2	22
Building research and structural engineering	37.0	40.0	-3.0	-7.5	37.0	40.0	-3.0	-7
Innovation and improved framework conditions	178.5	166.5	12.0	7.2	178.5	166.5	12.0	7
Humanities and social sciences	113.2	95.4	17.8	18.7	113.2	95.4	17.8	18

**BMFT's Areas of Responsibility**  
(as a percentage of the budget, excluding overall spending cuts and excluding ministry)



Key: 1. Technology and innovation funding—2. Interprogram basic research—3. Preventive research—4. Long-term state programs—5. Space—6. Basic research across all research areas, as a percentage—7. 1990-1991: estimate

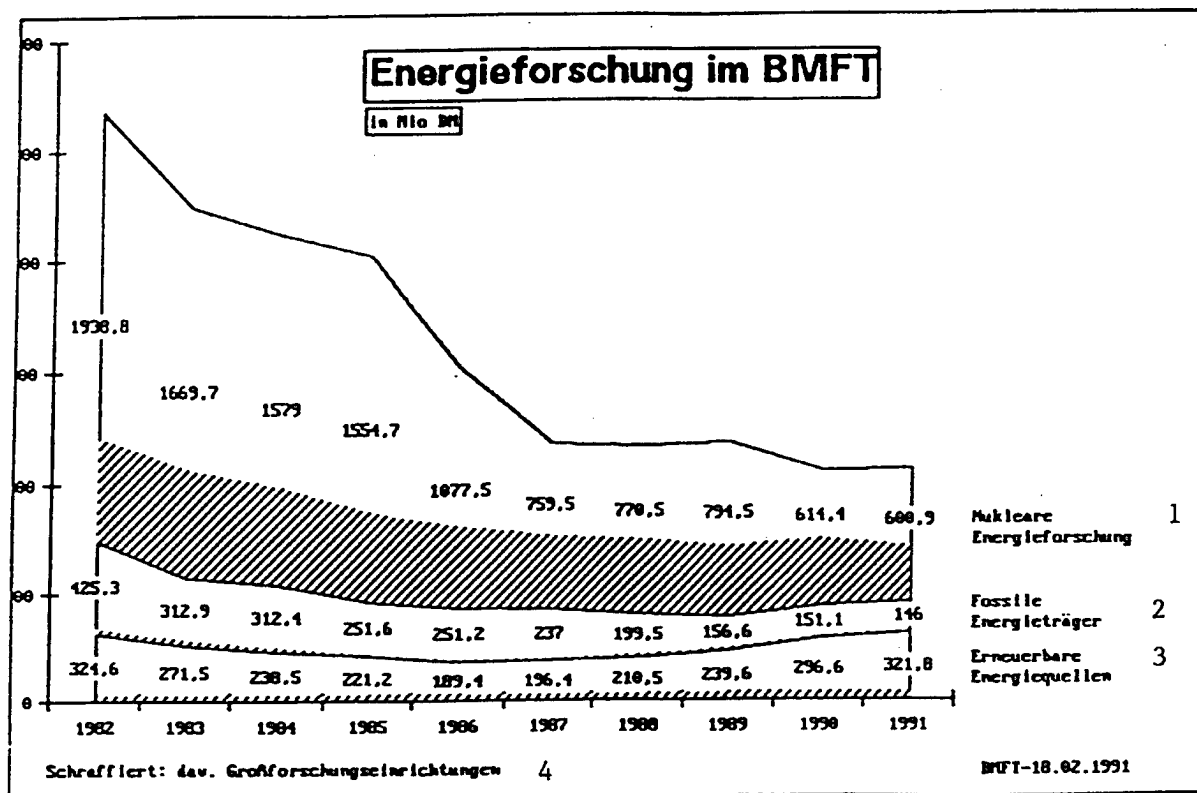
Preventive Research at the BMFT in DM millions



Key: 1. Environmental engineering—2. Climatic and atmospheric research—3. Ecological research—4. Health research

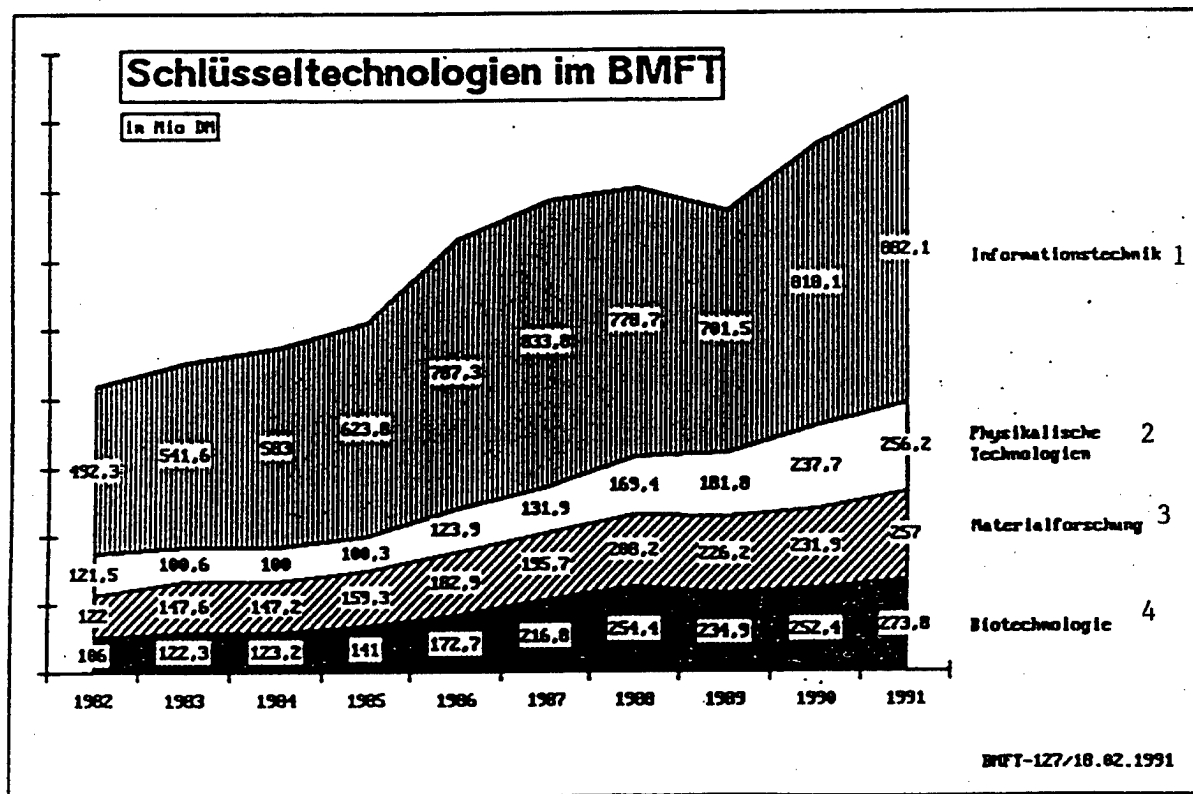


## Energy Research at the BMFT in DM millions



Key: 1. Nuclear energy research—2. Fossil fuels—3. Renewable energy sources—4. Hatched area: portion covered by major research facilities

Key Technologies at the BMFT



Key: 1. Information technology—2. Physical technologies—3. Materials research—4. Biotechnology

**BMFT-DAFIN Overview—Status: February 1991**  
**1991 Budget—Individual Plan 30**

Outline Funding Area/ Funding Program	Government Draft 1991 DM Millions	1991 Share in Indi- vidual Plan as Per- centage	1991 Percentage Increase Over 1990	1990 Projection in DM Millions	Actual Expenditure 1989 DM Millions
Individual Plan 30, total	8,400.0	100.0	6.8	7,867.4	7,607.4
1. Interprogram basic research	1,484.1	17.7	6.0	1,400.5	1,415.3
Basic Financing for Max Planck Society	509.5	6.1	8.2	471.0	457.2
Transitional funding for Academy of Sci- ences	0.0	0.0	0.0	0.0	0.0
Large-scale equipment for basic research	974.6	11.6	4.8	929.5	958.1
2. Long-term state programs	2,023.5	24.1	8.9	1,857.4	1,630.2
Marine research	112.8	1.3	-6.6	120.8	113.4
Polar research	68.2	0.8	19.5	57.0	64.4
Space research and space engineering	1,559.5	18.6	9.9	1,419.1	1,217.0
Nuclear fusion research	206.4	2.5	4.2	198.2	188.8
Earth sciences, deep drilling in particular	76.6	0.9	22.8	62.4	46.7
3. Preventive research	1,384.7	16.5	11.3	1,244.0	1,095.2
Environmental research; climatic research	592.7	7.1	20.1	493.6	424.1
Health-related research and develop- ment	384.6	4.6	5.7	363.9	341.1
Research and devel- opment on improving working conditions	100.0	1.2	2.6	97.5	90.3
Building research and structural engineering	37.0	0.4	-7.5	40.0	38.5
Humanities; social sciences	113.2	1.3	18.7	95.4	106.0
Interdisciplinary activity (including assessing the conse- quences of technology)	157.2	1.9	2.4	153.6	95.2
4. Technology and innovation funding	3,672.5	43.7	5.0	3,498.0	3,404.4
Basic financing for the Fraunhofer Society	180.3	2.1	9.6	164.4	152.9
Marine engineering	60.0	0.7	2.4	58.6	52.8
Coal and other fossil fuels	146.0	1.7	-3.4	151.1	156.6
Renewable energy sources and rational energy consumption	321.8	3.8	8.5	296.6	239.6
Nuclear energy research (including reactor safety)	600.9	7.2	-2.2	614.4	794.5

**BMFT-DAFIN Overview—Status: February 1991**  
**1991 Budget—Individual Plan 30 (Continued)**

Outline Funding Area/ Funding Program	Government Draft 1991 DM Millions	1991 Share in Individual Plan as Percentage	1991 Percentage Increase Over 1990	1990 Projection in DM Millions	Actual Expenditure 1989 DM Millions
Information technology (including manufacturing engineering)	882.1	10.5	7.8	818.1	701.5
Biotechnology	273.8	3.3	8.5	252.4	234.9
Materials research	257.0	3.1	10.8	231.9	226.2
Physical and chemical technologies	256.2	3.0	7.8	237.7	181.8
Aviation research and hypersonic technology	224.7	2.7	3.2	217.7	204.7
Research and development on surface transport and traffic	193.3	2.3	0.9	191.5	179.9
Ensuring raw material supplies	3.0	0.0	-50.0	6.0	5.6
Innovation and improved framework conditions	178.5	2.1	7.2	166.5	185.0
Technical information	94.8	1.1	4.0	91.1	88.4
Overall spending cut	-250.0	-3.0	25.0	-200.0	0.0
Not yet distributed to chapters and headings	0.0	0.0	0.0	0.0	0.0
Federal Ministry of Research and Technology	85.3	1.0	26.5	67.4	62.3

**German Science Council Begins Assessing Ex-GDR Institutes**

91MI0217 Bonn WISSENSCHAFT WIRTSCHAFT POLITIK in German 6 Feb 91 pp 6-7

[Text] The Institute of High-Energy Physics, Zeuthen (Brandenburg), is conducting "high level" international joint research. This Science Council pronouncement carries with it the recommendation that the Zeuthen Institute should continue to operate, "albeit on a reduced scale, as an extra-university research institute."

The Science Council does not, however, deem it necessary to set up a new major research facility. The institute's long-standing cooperation with the German Electron Synchrotron (DESY) suggests that it should be integrated into DESY in the future and operate from then on as a branch of the DESY organization.

The Science Council also wishes to see the central institutes of Molecular Biology, Cancer Research, and Cardiovascular Research in Berlin-Buch merged to form a future molecular medicine research center. There is no facility of this kind in the western part of the republic, said reelected Science Council chairman Dr. Horst Franz Kern, professor of cellular biology at Marburg. Kern believed that it could be funded by a foundation financed by the Federal Government and Berlin.

The Science Council has, moreover, designated areas that it believes definitely deserve retention within the Academy of Sciences. They include, for example, Alexander von Humboldt Research, the Ancient Egyptian Dictionary, and the complete Karl Marx edition.

The Science Council has also tabled recommendations on cooperation between major research facilities and institutes of higher learning.

**Germany: KfK Research Establishes Dresden Branch**

91MI0216 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 29 Jan 91 pp 6-7

[Text] The Karlsruhe Nuclear Research Center (KfK) opened its Dresden Project Management Branch Office in Dresden on 24 January 1991. Once the branch is up to strength, its staff of 10 will represent the following Federal Ministry of Research and Technology [BMFT] project management teams headquartered at the KfK:

- Hydraulic engineering and sewage treatment (PtWT);
- Waste disposal (PtE);
- Production engineering (PFT).

The project managers' job is to advise subsidy applicants, to provide the BMFT with decision-making support regarding individual research objects at research institutes and industrial companies, to monitor the projects, and to verify their level of success. The presence of these project management teams, which cover environment protection and industrial modernization, is intended to remove impediments to their utilization in the new laender through closer proximity to consumers, and to enhance cooperation with industry and research. The new branch is at the following address: Nuclear Research Center Karlsruhe GmbH, Dresden Project Management Branch, Hallwachstr. 3, O- 8027 Dresden.

Specifically, the KfK project managers mentioned above cover the following areas:

The PtWT promotes research and development on the technical aspects of water conservation, water supplies, waste water disposal, sewage recycling and disposal, and analysis and control technologies. Funds amounting to about 50 million German marks [DM] are available annually for subsidies. Preference is given to joint projects between research institutes and industrial companies.

The PtE emerged, effective 1 January 1991, from the former "Alternative Waste-Disposal Technologies Project Team" and "Shutdown and Nuclear Waste Disposal Project Management Team." This new development arises out of a non-nuclear component, which focuses primarily on the ultimate disposal of special waste, merging with what was previously an exclusively nuclear disposal program. Annual subsidy funds totaling about DM50 million have been set aside for this purpose.

The PFT promotes the integration of modern information technologies into the development and manufacturing process, the further development of quality-assurance systems, and support measures in the form of complementary research, standardization, and technology transfer. In particular it will support small and medium-sized industrial firms in internal restructuring and in international competition. About DM100 million is available annually for subsidies.

The project managers at the KfK can be reached by telephone at the following numbers: PtWT: 07247/82-4850; PtE: 07247/82-5790; and PFT: 07247/82-5280.

#### **BMFT Funds Biotech Research in Eastern Laender**

91MI0198 Bonn *TECHNOLOGIE-NACHRICHTEN*  
MANAGEMENT-INFORMATIONEN in German  
18 Jan 91 p 5

[Text] In July 1990, scientists in biology and biotechnology research institutes in the former GDR were asked to draw up a series of project outlines presenting their view of the shape that their research should take in the future. Their outlines would then provide the Federal

Ministry of Research and Technology (BMFT) with a significant basis for decision-making.

Since then, the BMFT has received some 650 project outlines (approximately 60 percent from Agricultural Academy and from Academy of Sciences institutes, 20 percent from academic institutes, and 20 percent from industry). They have been assessed by eastern and western German scientists in a joint procedure with the specialized committees of the German Chemical Apparatus Engineering, Chemical Engineering, and Biotechnology Society (DECHEMA) in Frankfurt on the Main. About 250 outline projects have been recommended for applications for funding under the BMFT's biotechnology program. In individual cases, project leaders have been advised to apply under other BMFT funding programs or to the German Research Society (DFG) as well.

In the meantime, BMFT funding has been approved for 200 biotechnology projects at institutes of the former Academy of Sciences, the universities, and the agricultural Academy for the period from January through December 1991. Funds totaling approximately 12 million German marks [DM] have been approved, and 50 more projects from industry are expected to follow. Financing amounting to about DM5 million is earmarked to fund them in 1991.

Biotechnology funding in the new Laender will focus primarily on method and process development. The following are the major areas:

- Bioprocess and bioreactor engineering (DM1.8 million);
- Biocatalysis and enzyme engineering (DM1.7 million);
- Animal cell cultivation (DM1.7 million).

Biological waste disposal processes (DM1.2 million) and biological safety research projects (DM0.8 million) also account for a high proportion of the funding.

The subsidies are mainly intended to help overcome the unfavorable conditions for biotechnology research in the former GDR. Not only was there a shortage of material and technical equipment, but, more importantly, researchers were unable to travel, acquire information, hold technical talks, or compete or work with the best colleagues. The aim is to achieve a close integration of the scientific potential in western and eastern Germany as soon as possible and thus attain high quality biological research and technology in all parts of Germany.

#### **German's KfK Nuclear Research Center Announces 1991-1994 Research Budget**

91MI0171 Bonn *WISSENSCHAFT WIRTSCHAFT*  
POLITIK in German 16 Jan 91 pp 6-7

[Text] The Karlsruhe Nuclear Research Center (KfK) recently presented its medium-term work and financial schedules for the years 1991 to 1994 along with its 1991 program budget. They show that environmental research

has taken the lead in the medium term among the Nuclear Research Center's main programs. Nuclear research and development work, therefore, recedes further into the background. Even so, the Nuclear Research Center still bears the main responsibility for the Federal Republic of Germany's international commitments in this field.

At present, the Nuclear Research Center's total budget is around 735 million German marks [DM]. This includes "permanent" funds amounting to about DM80 million for commitments such as the Laue-Langevin Institute in Grenoble, project management, and special funding. When the center's own earnings of DM123 million are subtracted, this leaves DM612 million that the KfK receives out of public funds.

With its 23 percent share of the budget, environmental research and development has highest priority, followed by nuclear fusion with 19 percent. The remaining quotas are: nuclear safety research (15 percent), solid-state and materials research (11 percent), nuclear waste disposal (10 percent), microengineering (8 percent), handling technology (7 percent), and basic physics research (6 percent).

Key technologies are now the pacemakers of technological change. The KfK is working on three fields in this category that have special significance for funding policy:

In **solid-state and materials research**, materials are being developed for advanced technical applications. At present, these are mainly high-stress materials and superconductors.

The discovery of superconductors at temperatures above the boiling point of nitrogen has speeded up development in this field worldwide. Studies are currently focusing on the new oxidic superconductors, although the successful development of helium-cooled superconductors, which have almost achieved technical maturity, is not being neglected.

A well-advanced sector of the **microtechnology** program is the production of mechanical microcomponents by a process involving X-ray lithography and galvanoplastic casting technology.

The **handling technology** program is developing systems allowing combined operator-controlled and program-controlled automatic operation. The long-term target is the development of autonomous systems that incorporate sensor technology and information processing to develop artificial intelligence.

This major research center does not deal only with the "big players." The KfK has been arranging transfers of technological developments to medium-sized industrial companies and small enterprises for more than 10 years. As opposed to the major projects, where whole technological packages are developed in close cooperation with industry in accordance with targets set by the research policy makers, technology transfer means the industrial exploitation of peripheral spinoffs from major projects under which they will not be further pursued.

### Dutch Science Budget Analyzed

91AN0219 Zoetermeer *SCIENCE POLICY IN THE NETHERLANDS in English Dec 90 pp 3-6*

[Article by Saskia van der Ree: "The 1991 Science Budget: Foresight Studies Set the Agenda"]

[Excerpts] Even more than in previous years, it is essential that the 1991 Science Budget document forms the basis for the political agenda. It focuses on five main themes, of which scientific foresight studies is the most important. The government wants to be able to make well-targeted decisions on science and technology; foresight studies are an important decisionmaking instrument in this connection. The other four main themes are internationalisation, energy research for the long-term, the further development of environmental research, and multidisciplinary research.

The emphasis on a number of main themes in the Science Budget results from the policy guidelines laid down in the 1989 policy document "A New Research Landscape in View." Every year, the Science Budget contains a number of themes which touch on the findings of the policy document. Each Science Budget document also gives a summary of current research programmes and government spending on research and development.

### Foresight Studies

[passage omitted] Total expenditure on academic research is set to rise by 2.8 percent on the 1990 figure to 11,845 million guilders (see table). This increase is mainly the result of funding by industry. In 1980, 50 percent of research was funded by the government and 43 percent by industry. The 1991 figures will be 40 percent and 55.8 percent respectively. Research expenditure as a percentage of gross national product is on the decrease. In 1990 it was 2.28 percent and will fall to 2.23 percent in 1991.

## Approximate Distribution of Research Funds in 1991 (in millions of guilders)

Funding to/from	Total	Business enterprises	Research institutes	Universities	Intermediary organisations	International organisations
State	4,730	715	1,695	1,675	430	215
Own funding:						
—Business enterprises	6,625	6,615			10	
—Research institutes	290		290			
Abroad	200	140	50	10		
Primary distribution	11,845	7,470	2,035	1,685	440	215
Final distribution:						
—Business enterprises	7,100	6,950	125	5	20	
—Research institutes	2,285	350	1,740	5	190	
—Universities	2,100	30	165	1,675	230	
—International organisations	215					215
—Abroad	145	140	5			

## Notes:

**Business enterprises:**

The "big five companies" (approximately 80%): 5,680

Others (approximately 20%): 1,420

**Research Institutes:**

TNO (Netherlands Central Organisation for Applied Scientific Research): 306

NWO (Netherlands Scientific Research): 179

NLR (National Aerospace Laboratory): 53

SWL: 12

KNMI (Royal Netherlands Meteorological Institute): 9

ECN (Netherlands Energy Research Center): 57

KNAW (Royal Netherlands Academy of Arts and Sciences): 73

MARIN (Netherlands Maritime Research Institute): 9

SWOV (Road Safety Research Institute): 4

Agricultural research institutes: 299

NIVEL: 3

NKI (Netherlands Cancer Institute): 16

RIVM (National Institute of Public Health and Environmental Hygiene): 35

**Universities:**

1st flow of funds: 1,673

2nd flow of funds: 230

3rd flow of funds: 200

**Intermediary organisations, including:**

NWO

STW,

SVO,

NIVR (Dutch Institute for Aircraft Development and Aeronautics),

CMO

**International organisations:**

CERN (European Center for Nuclear Research): 54

ESA (European Space Agency): 124

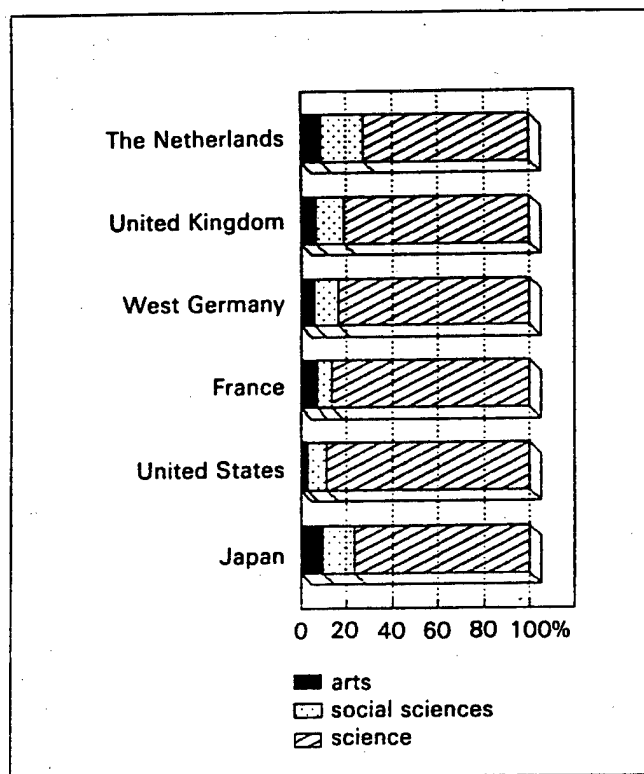
ESO (European Southern Observatory): 8

EURATOM: 19

NATO S.C.: 2

EMBL/BL (European Molecular Biology Laboratory): 5

**Figure 1.**  
Government  
expenditure  
on academic  
research in  
1987 (as a  
percentage of  
the total)



Absolute government expenditure on  
academic research in millions of dollars:

The Netherlands 958  
United Kingdom 2,798  
West Germany 4,037  
France 3,212  
United States 14,904  
Japan 3,736

### Internationalisation

It is important that Dutch researchers work more closely with researchers in other countries in the context of existing cooperative arrangements. Dutch researchers are to improve and increase their contribution to large EC projects such as ESPRIT [information technologies], RACE [telecommunications], and DELTA [training].

This year, during the Netherlands' chairmanship of EUREKA, the emphasis is on the relationship between Eastern and Western Europe, global environmental research, and large-scale EUREKA projects such as COSINE (telecommunications links between researchers) and HDTV (high-definition television). These matters will be discussed at a ministerial meeting due to be held in June 1991. In May next year, during the Netherlands' chairmanship, EUREKA will celebrate its fifth anniversary. A committee chaired by Dr. W.

Dekker (the former head of Philips) is also due to present an evaluation of the EUREKA initiative to the ministers of economic affairs and education and science. Besides EUREKA, the Science Budget also lists many other areas in which the government would like to see international collaboration, including space travel and the ethical considerations surrounding new developments in biotechnology and medicine.

Organisations such as CERN and ESA are a very important feature of the European research landscape, since they allow researchers access to equipment which individual countries cannot afford to buy. The European Science Foundation (ESF) should play a more important role in decisionmaking on investment in large-scale European research facilities.

### Ethics

At both national and international level important developments are under way with regard to the ethics of



advances in biotechnology and medicine. In March, the Dutch Lower House of Parliament accepted the Laning-Boersema motion, which called upon Dr. Ritzen, in his capacity as minister responsible for coordinating science policy, to draw up a framework for the discussion of the ethical and social aspects of research. The minister is due to present a memorandum on this matter to the House in the autumn. The Netherlands Organisation for Technology Assessment (NOTA) has been asked to compile a report on the ethical aspects of research and the definition of the term "ethics" employed in the world of scientific research. The report will be published in autumn 1990 as part of the minister's memorandum.

At the international level, too, further agreement must be reached on the limits of research. The key issue is: To what extent is genetic engineering or the alteration of genetic material (mainly from animals) acceptable?

At its meeting on 29 June 1990, the EC Council of Research Ministers decided to set up a working party of experts to inventory legislation and current ethical developments with regard to embryo research in EC member states.

### Environment

The subject of long-term environmental research was first broached in last year's Science Budget document. At the international level, the introduction of the proposed changes is proceeding only slowly because of the extensive consultative procedures involved. The Netherlands is one of the countries behind the setting up of a steering group which is calling upon national governments to become more involved with global environmental problems such as climate change, rising sea levels, and with activities such as earth observation. Besides the countries responsible for the setting up of this informal steering group (Germany, the United States, and the Netherlands), it also includes representatives from Japan, Canada, France, the United Kingdom, Norway, Finland, and the EC. The Netherlands is due to host a meeting of the group in July 1991.

At the national level, the Ministry of Education and Science will work with the other ministries involved (Housing, Physical Planning, and the Environment; Agriculture, Nature Management and Fisheries; Transport, Public Works and Water Management; and Economic Affairs) to strengthen long-term research. The National Research Programme on Global Atmospheric Pollution and Climate Change (funded by the Ministry of Housing, Physical Planning, and the Environment) and the NWO Priority Programme on the Disruption of Earth Systems are currently being integrated. A committee, chaired by the environmental economist Dr. J.B. Opschoor, is to examine the Environmental Economy in detail and will report its findings in spring 1991. The aim of the committee is to incorporate environmental economics into current economic research.

### Energy

Energy research is once more a focus of attention in the 1991 Science Budget, in the wake of growing concern about the environment. Long-term energy research concentrates primarily on sustainable development, i.e., the generation of energy from renewable sources, such as nuclear fusion and photovoltaic conversion (solar cells). At international level, important developments are under way with regard to nuclear fusion. The European Community's programme now leads the field in global nuclear fusion research. Encouraging results have also been achieved in respect of research into photovoltaic, photobiological, and photobiochemical conversion.

### Multidisciplinary Research

The policy document "A New Research Landscape in View" pointed to the importance of multidisciplinary research (MDR), in which several disciplines are involved. This type of research is not only necessary as a source of scientific innovation, but also as a means of addressing certain social questions which cannot be addressed by one individual discipline. The research system in the Netherlands is strongly monodisciplinary in character, despite the fact that complex problems, for instance in the environmental and health care areas, cannot be reached within one discipline. The Science Budget distinguishes three types of problem which could hamper multidisciplinary collaboration. The first is the nature of MDR. Cultural differences—differences in methods and principles—between different disciplines impede multidisciplinary collaboration. A second impediment lies in the fact that the organisation of current research is very monodisciplinary in character. Finally, the strict divisions between departments do not promote multidisciplinary research. The further development of MDR requires strong leaders who favour a multidisciplinary approach. Research into areas which require such an approach could also be encouraged.

The NWO has already taken steps in this direction with its STIMULUS programme and TNO is giving MDR a higher profile in its institutions. The programmes to promote science policy and the Innovation-Oriented Research Programmes (IOPs) of the Ministry of Economic Affairs are also largely of a multidisciplinary nature.

### Other Areas of Attention

Part two of the Science Budget—the report—examines the achievements of the past year in the field of information research and current programmes. "A New Research Landscape in View" emphasised the importance of "information" for science policy in the nineties.

Future Science Budget documents will give more attention to computerisation. Information technology offers a way of tackling difficult problems and therefore increases the options available to scientists. The NOTA report ("Technological Assessment: Adjustment or Direction?") indicates that a good deal of attention is being paid to the impact of information technology.

There are plans to investigate the possibility of researching the attitude of the Dutch public to science and technology over the coming year. The key concept of the survey will be "scientific literacy." In a society which is increasingly applying the results of research, it is important that people continually increase their knowledge of science and technology.

Science and technology indicators—quantitative data on research—play an important role in the evaluation process. They include the percentage of gross national product spent on scientific research and the human and financial resources channeled into research in universities and companies. Indicators can also be used to quantify the "output" of research by, for example, counting the number of publications and citations, or by more advanced methods such as co-word-analysis (the extent to which terms coined for the purposes of a particular project are referred to by other researchers, and the extent to which this gives rise to new sets of terms which point to the possible emergence of new areas of science). Indicators can give an insight into developments and trends in science, as well as the use of resources (accountability) and the achievements of aims (evaluation). They can therefore be useful as a foundation for policy. The Science Budget proposes that the use of indicators be increased, both in science policy and in the research world itself, and that science and technology indicators be published regularly.

#### **Dutch Government Subsidizes Philips Projects**

91AN0287 Amsterdam *COMPUTERWORLD* in Dutch  
20 Feb 91 p 1

[Article: "Philips Certain of Government Support for JESSI [Joint European Submicron Silicon Initiative] and HDTV [high definition television]"]

[Text] Philips in Eindhoven can continue to count on government support for two electronics projects, the Joint European Submicron Silicon Initiative (JESSI) and high-definition television (HDTV). This is clear from a letter sent by Minister Andriessen of Economic Affairs to the Standing Committee for Economic Affairs in the Second Chamber. "Initiatives by Philips in this area, as well as by others participating in JESSI, will be considered positively," said Minister Andriessen.

The minister feels that Philips, which is operating from the relatively expensive and small-size Dutch home market, can only compete by manufacturing products that are advanced and knowledge-intensive. "That means among other things that Philips must be foremost in such a fundamental technology as microelectronics. An industry whose products are based on high-quality electronics loses in significance if it has to be dependent upon deliveries from third parties. In consequence, there are strategic considerations for supporting the European microelectronics industry both financially and nonfinancially," according to Minister Andriessen's letter to the Chamber. He pointed out that Philips, despite the recent

cutbacks, is still one of the largest private employers in the country. According to Andriessen, Philips is unique in the Netherlands if only because the concern devoted 2 billion guilders to R&D, which is 35 percent of the total Dutch industry's R&D commitment. In addition, 20 percent of Dutch companies with more than five employees deliver goods and services to Philips. This equals about 13,000 businesses with an order value of approximately 3 billion guilders per year. "In short, both directly and indirectly, Philips plays a key role in the Dutch economy, particularly when it concerns advanced technology," according to Minister Andriessen.

#### **Targeted Support**

In his letter, Andriessen writes that the Netherlands' ability to give general financial support to an internationally competitive company such as Philips is limited: "It is known that concerns such as Philips can command generous financial support in several European countries. Further, these countries often possess a scientific and technological infrastructure which can be of great material importance to a company such as this." According to the minister the limited Dutch resources must be spent as efficiently as possible. It has therefore been agreed with Philips that Dutch support should be aimed at a few projects which are of strategic importance for both Philips and the Netherlands. In return, Philips will not apply for any further generic support. According to Minister Andriessen, one of the benefits of this approach is that our country will be in a better position to meet its international commitments made within the scope of the EUREKA [European Research Coordination Agency], JESSI, and HDTV projects.

#### **Not Sensible**

The minister reminded the Chamber that as far as submicron-level integrated circuits (IC's) are concerned, Philips has withdrawn from the development of static random-access memories (SRAMs). The concern considers continuation of this part of the JESSI project to be no longer sensible, by which it means that these memory ICs cannot be profitably produced. Philips is, therefore, now concentrating on the production and development of ever more complex ICs which will be used in products or in a product range, and then preferably in its own products. "Philips thinks that it can still play a leading role in the field of integrated circuits, even without itself being involved in the development of a memory project," said Andriessen. The minister announced in an accompanying confidential letter that had earlier been sent to the Second Chamber that a Dutch committee of experts is to be set up which will coordinate JESSI projects in the Netherlands. Its chairman will be Dr. C. le Pair, who already sits on the international team of JESSI experts. The fledgling committee has already let it be known that in principle it supports the Philips position. It agrees that, in the new strategy, static memories can no longer play a technologically leading role.

## CORPORATE ALLIANCES

**Japanese Firm Establishes Pharmaceutical Joint Ventures***91MI0206 Duesseldorf HANDELSBLATT in German  
11 Feb 91 p 19*

[Text] Meiji Seika Kaisha Ltd., the Tokyo-based Japanese producer of confectionery and pharmaceuticals (majority-held by the Dai-Ichi Kangyo Bank) has acquired a majority stake in the Spanish pharmaceutical company, Tedec Zambeletti (TZ), Madrid.

This medium-sized pharmaceutical company (sales around 25 million German marks [DM]) will be expanded to form an antibiotics production base. Meiji Seika has also concluded a joint antibiotics distribution agreement with British pharmaceuticals manufacturer SmithKline Beecham Plc [Public limited company] covering the whole European market.

Meiji Seika, which ranks 12th in the Japanese pharmaceutical sector, has also announced its intention to buy stakes in other European pharmaceutical companies, or to take over whole companies, to increase its share of the European pharmaceuticals market as regards both distribution and production. For this purpose, Meiji Europe, a financing company, has been set up in Amsterdam, the Netherlands, as a channel for refinancing these transactions.

Meiji Seika, which has acquired a 60 percent majority holding in the Spanish manufacturer, plans to second some of its employees to the Tedec Zambeletti management team in the near future. In 1994, the Spanish company will start producing three types of antibiotics on behalf of the Japanese manufacturer, with initial sales estimated at DM45 million a year. So far, Meiji Seika has only exported basic antibiotic preparations to Europe, for an estimated DM40 million a year.

In order to strengthen its sales position on the European market, the Japanese company has also concluded a cooperation agreement with SmithKline Beecham, under which special priority is given to an antibiotic preparation called "Meicelin." Sales of this preparation in Japan amount to the equivalent of DM200 million.

In the financial year 1989/90 (31 March), Meiji Seika Kaisha (which has 5,200 permanent employees) reported a 310 billion yen [Y] (around DM3.5 billion) consolidated income, with foodstuffs accounting for 60 percent, pharmaceuticals for 40 percent, and with exports standing at five percent. Consolidated ordinary profits (profits before extraordinary income and taxes) totaled Y8.2 billion (less than DM100 million).

A seven percent increase in unconsolidated sales to Y222 billion (around DM2.5 billion) and a marked 11 percent drop in ordinary profits to Y7 billion (about DM80 million) are predicted for the current financial year, largely as a result of the increased cost of outside funds.

**Hoechst, Teijin Establish Joint Venture for Polyester Fibers***91MI0144 Duesseldorf HANDELSBLATT in German  
17 Jan 91 p 15*

[Text] Hoechst Japan Ltd., Tokyo, and the leading Japanese polyester manufacturer, Teijin Ltd., Osaka, have agreed to found a joint venture to be responsible for selling Hoechst's Trevira CS fiber in the Asian and Pacific area. The joint venture, "Hoechst Teijin Fibers Ltd.," in which the German partner will hold a 51 percent majority interest, is scheduled to begin operations in February. After initial imports from Germany, the Japanese partner's Tokuyama plant is due to begin producing Trevira CS in mid-1992. The partners expect to invest about 15 million German marks [DM] to increase the plant's production capacity, which is currently running at 10,000 tonnes a year.

Teijin Ltd. will market the fibers produced by Hoechst Teijin Fibers Ltd. on the Japanese market. Hoechst Japan will cover sales in the other countries in the Far East and Oceania. The partners aim at total sales of 600 million yen [Y] (approximately DM7 million, 1,000 tonnes) in 1991 with the imports from Germany. Sales for 1993 are projected at Y2.1 billion, approximately DM25 million, 3,500 tonnes) and Y3 billion (approximately DM35 million, 5,000 tonnes) for 1996.

**Mitsubishi, Germany's Hoechst Merge Polyester Film Production***91WS0151C Paris LE MONDE in French  
24 Jan 91 p 40*

[Article by Andre Dessot: "Germany's Hoechst, Japan's Mitsubishi Team Up To Produce Magnetic Recording Tapes"]

[Text] On 22 January, Germany's giant Hoechst, one of the world's leading chemical manufacturers, and Japan's powerful firm Mitsubishi announced their decision to merge their production of polyester films, not only those specific to photography, reprography, electronics (dielectrics for capacitors), and packaging, but also—and this is the key point of the agreement—those used in the manufacture of very advanced products for recording (audio, video, data processing).

Effective around mid-1991, all the employees of the two groups will be combined in a joint venture (51 percent Hoechst, 49 percent Mitsubishi), specifically, on the one hand, the installations of Kalle, a Hoechst subsidiary and currently the number one European manufacturer of magnetic tape, at Wiesbaden, as well as those of the Celanese Corporation, Hoechst's American subsidiary; and on the other, Mitsubishi Kasei, Mitsubishi Plastics, and particularly, Diafoil, the third largest Japanese manufacturer of polyester film for magnetic recording tapes. The investments will exceed 300 million German marks [DM] (1 billion francs [Fr]). Further down the road, the two groups have agreed to exchange shares. As a result of this merger,

Hoechst will become the world's number one manufacturer of polyester film, all types included, with a capacity of 160,000 metric tons annually, an annual revenue of DM800 million (Fr2.8 billion), and 30 percent of the market. Importantly in this respect, Hoechst-Mitsubishi will become the world's largest producer of magnetic recording tapes, with a production capacity of 53,000 metric tons annually, and over 50 percent of the world market.

The two groups decided that it was senseless to tear each other apart for the sake of supplying 110,000 metric tons a year of magnetic tape to the world cassettes market, which is still growing strongly (plus 20 percent) but is being torn to bits by a suicidal price war, owing to the advent of outsiders from Southeast Asia, who are making life miserable for the already too numerous big producers, such as BASF, Sony, TDK, Maxell, FDM, Scotch, Fuji, and others. Neither Hoechst nor Mitsubishi would have been able, alone, to attain the necessary critical size in a world industry dominated, on the one hand, by Toray and Teijin (Japan), and on the other by DuPont, 3M (United States), ICI (Great Britain), and Rhone Poulenc (France). In 1985, the French chemicals group set the example by teaming up with Japan's Toyobo. Six years later, Hoechst duplicated it, going full tilt forward with Mitsubishi.

#### **EC Authorizes Aerospatiale-MBB Helicopter Merger**

91AN0289 Brussels EUROPE in English  
27 Feb 91 pp 9-10

[Article: "EEC/Competition: The Commission Has Authorized the Merger Between Aerospatiale (France) and MBB (Germany) in the Helicopter Sector"]

[Text] Brussels (Agence Europe)—The European Commission has decided to give formal clearance under the merger regulation to the creation of Eurocopter S.A. by the French state-owned company Aerospatiale (AS) and the German Messerschmitt-Boelkow-Blohm GmbH (MBB). The two companies have agreed to merge their helicopter activities. They intend to combine their helicopter divisions in the newly-created holding company, Eurocopter S.A., which will be jointly controlled by AS and MBB.

Whilst MBB is by far the smallest European helicopter manufacturer, AS is clearly the leading company in this sector. The proposed merger does not, however, lead to the creation or strengthening of a dominant position within the EC.

#### **The Military Sector**

The merger does not significantly strengthen the already strong positions of AS and MBB on the French and German markets for military helicopters. AS and MBB are neither actual nor, at least for the foreseeable future, potential competitors in these markets, given the particular conditions of the defence industry and the already established development programmes (combat helicopter

PAH2, NATO helicopter NH90) which will cover essentially the future requirements of the French and German armed forces. Although the Commission expects military procurement eventually to come into line with the requirements of an open internal market, national procurement remains the rule in this sector for the time being. It would therefore not be reasonable to characterize AS and MBB as potential competitors in each other's national markets. Market positions will not be altered by the merger.

#### **Civil Sector**

In the civil helicopter business, the situation is quite different. The market is open and competitive throughout the EC. Although the merger leads to a relatively high combined market share of AS/MBB in the EC market for civil helicopters, the behaviour of the merged company will be constrained by the competitive strength and potential of other EC and U.S. manufacturers.

AS and MBB have declared that they will continue to be as open to collaboration and cooperation with the other European helicopter manufacturers as in the past.

#### **Matra, Systemtechnik Nord To Cooperate in Non-Military Electronics**

91MI0164 Duesseldorf HANDELSBLATT in German  
11-12 Jan 91 p 16

[Text] Systemtechnik Nord [northern system engineering] GmbH (STN) in Bremen, which was founded last year, is negotiating with the French armaments and electronics group Matra on a 10 percent Matra holding in STN, STN chairman Hans E. W. Hoffmann told newsmen in Hamburg.

In the opinion of Hoffmann, who is conducting the talks for the German side, a memorandum of understanding to this effect is ready for initialing. STN arose out of the merger between Daimler-Benz and Messerschmitt-Boelkow-Blohm (MBB), into which the naval commitments of MBB and Telefunken Systems Engineering (formerly AEG) had been incorporated, as directed by former Federal Economics Minister Haussmann, backed up by the trade ministers and senators of the four coastal Lands.

STN's entire 155 million german marks [DM] capital is held by the Bremen Vulkan Shipyard Group. STN in turn holds 51 percent of both MSG Naval and Special Engineering GmbH, Bremen (formerly MBB) and DMT Naval Engineering GmbH, Hamburg (formerly Telefunken). The remaining 49 percent is held by German Aerospace AG (DASA), Munich, through companies in its group.

Dasa, however, must sell its share by the end of September 1991 as a result of merger regulations. If no other buyer can be found, and it may be difficult for the time being, Vulkan will take over the two 49 percent shares. In the event of Matra involvement, Matra would receive 10

percent each of the MSG and DMT shares from Dasa's holding, and these shares would later be converted into STN holdings.

Hoffmann regards Matra primarily as an electronics partner in which STN is keenly interested, as it wishes to reduce its current, well over 70 percent dependence on military technology to 50 percent by the year 2000. Hoffmann would also look with favor on another foreign electronics partner, either from Italy or from Great Britain, such as Marconi, as an STN shareholder.

According to Hoffmann, STN has shown the first signs of its intention to increase the proportion of civilian products in its product range. With the approval of the Bremen Vulkan and Vulkan boards, the 1991 research and development budget has been weighted in favor of the nonmilitary sector. In addition, STN's naval weaponry, naval systems, marine electronics appliances and equipment, unmanned aircraft, and logistic divisions will be expanded to cover civilian business as well. Hoffmann sees special opportunities in marine technology.

With its 2,500 employees, STN's had income amounted to about DM1.2 billion in the 1990 financial year, and Hoffmann anticipates that this year's results will be "still good." Until the mid-nineties Hoffmann expects his company to work to capacity, forecasts annual income of about DM1 billion, and reckons that its accounts will be in the black in the next few years as well.

## CORPORATE STRATEGIES

### Japan, Korea Plan Investments in Former GDR

91M10254 Duesseldorf *HANDELSBLATT* in German  
18 Mar 91 p 6

[Text] Tokyo—Japanese trade and industry's present involvement in the five new laender and Berlin is marked by the establishment of sales and customer service centers in the automobile and electrical industries. Considerable involvement can also be seen in the service industries.

Thus, present and future operations on the part of Japanese companies will be supported and independent business potential opened up. Last but not least, there is already a limited number of cooperation agreements with partners in the laender.

To foster these activities, at the beginning of this year the German Chamber of Industry and Commerce compiled a comprehensive 200-page dossier on the new federal states entitled "Basic Economic Data and Trends," which informs potential Japanese investors in detail about investment conditions in eastern Germany. However, there has to date been no proper presentation by the Treuhandanstalt [the holding company arranging privatization of state-owned enterprises in eastern Germany] in Japan. When one does appear, it should take pains to refute the criticism sometimes heard in Japan as to the agency's bureaucratic methods.

But on the whole the new laender are not virgin territory for the major Japanese companies. Back in the early seventies, the seven leading Japanese general trading companies had signed long-term consortium agreements with foreign trading companies in the GDR. Moreover, production plants in the former GDR, especially chemical and steel works, had been modernized by Japanese plant construction companies and several building projects, including three hotels, completed.

### Brokerage Firms Seek Participation in Privatization Transactions

Automobile manufactures Toyota Motor, Nissan Motor, Honda Motor, Mazda Motor, Mitsubishi Motor, and Yamaha Motor (motorcycles, alongside its parent company Yamaha Corporation, which is also in the musical instrument business), and entertainment electronics companies such as Sony, Pioneer, JVC, Hitachi and Matsushita ("National Panasonic") in particular are currently engaged in establishing sales and service networks.

In the industrial sector, companies such machine tool manufacturers Yamazaki Mazak and Okuma are endeavoring to consolidate their presence in eastern Germany, as business had already been done with the former GDR in this sector too. Also, in recent months the leading building companies have set up bases in Berlin with a view to early involvement in projects in this region.

In addition to all this, the involvement of Japanese banks, leasing and real state companies, general trading houses, securities and insurance companies, and freight companies in the new laender and Berlin is a sure indication that eastern Germany is considered of prime importance in the future European economic zone and that the presence of Japanese production companies there can be expected to expand considerably in the future.

The leading Japanese brokerage house Nomura Securities, no less, has made it clear that its engagement in Berlin will open up new business opportunities; these include involvement in privatization and financing operations, and introductions onto the stock exchange, venture financing business, asset and real estate management business, advising Japanese investors, and assistance with business acquisition and investment. There is also considerable Japanese interest in participating in urban development projects in Berlin (building shopping centers), laying out golf courses in the Berlin area, and cooperating in the construction of a major international airport to the south of the city.

Spectacular joint projects in the new laender, some of which are still in the planning stage, with partners from Germany or other European countries include:

1. The construction of an oil refinery in Rostock by the Marubeni general trading house and Toyota Engineering;

2. Technology transfer and joint production of heavy diesel motors at the Rostock Motor Works: Mitsubishi Heavy Industries;
3. Joint marketing with Florena Waldheim (previously State Cosmetics Combine): Goldwell/Kao;
4. Contract production of video equipment components at Stern Radio: J2T/JVC;
5. Joint venture for the production and sale of printing inks with the Halle Combine: Sun Chemical/Dainippon Ink and Chemicals;
6. Telefax production under contract at Robotron: Nissei Opto, MEI Japan.

For at least some of the companies, the expansion of their presence in eastern Germany is also seen in the context of the opening up of other central and eastern European markets. A survey by the Nomura Research Institute, one of the leading economic research institutes in the country, which has close contacts with industry, cites the following two motives:

1. Exploitation of long-standing trade and logistic relations between the former GDR and other countries in the same region for their own business;
2. Exploitation of the expertise in opening up markets in the new laender acquired by the sales community that has existed to date in the previous Federal Republic for further activities in central and eastern Europe. Another group of the companies regard Austria as another important base.

As far as the involvement of Korean companies in the new laender is concerned, the six representatives of the chambers of trade and industry from Mecklenburg Vorpommern, Brandenburg, Saxony-Anhalt, Thuringen, and Saxony who took part in the "Technogerma Seoul 1991" German trade exhibition in late February and early March reported "extraordinarily strong interest" in current developments in eastern Germany.

#### **Korean Delegation at the Leipzig Trade Fair**

There were also very concrete questions from individual companies concerning investment sites, although there have as yet been no concrete results. However, participation proved worthwhile and will continue at the planned "German Trade Fair Seoul 1992" consumer goods exhibition.

The head of the German-Korean Chamber of Industry and Trade, Florian Schuffner, announced that the Korean state foreign trade organization, Kotra (a subdivision of the foreign trade ministry), will now also visit the Leipzig Trade Fair and will send a delegation to Erfurt at the end of May: "This shows that the Korean state is promoting these efforts to a certain extent." For the present, however, caution prevails among companies, and their primary interest is in trade and marketing, particularly in consumer

electronics. Schuffner does not believe that direct investment is really to be expected.

#### **Grounds for Japanese Investment Strategy in Europe**

*91MI0253 Duesseldorf HANDELSBLATT in German  
14 Mar 91 p 14*

[Article by Andreas Gandow: "Europe's Chemical and Pharmaceutical Industries Still Considered Superior"]

[Text] Tokyo—In the prelude to the completion of the European single market, Japan's involvement in Europe is gaining breadth and depth: Companies are not only setting up Europe-wide sales and information networks but are also transplanting supplier systems to Europe and commencing operations in preliminary [vorgelagert] production stages (chemical and steel industries) through general trading companies. More and more Japanese companies are setting up special European headquarters to coordinate this complex involvement.

Japanese industry's European strategy is based on comprehensive analyses of the strong and weak points of European competitors. A survey by the Industrial Bank of Japan ("EC 1992 and Japanese Corporations") reaches the following conclusions regarding the branches relevant to Japanese involvement with the EC:

- The iron and steel industry in the EC states is slightly inferior to the Japanese competition in terms of technological level and productivity and lags well behind in profitability. Thus, crude steel production is only 220 tonnes per employee in the EC as against more than 367 tonnes in Japan.
- The chemical and pharmaceutical industries in the EC are far superior to the Japanese competition in terms of technological level, performance potential, basic research, internationalization of corporate operations, business position in fine chemicals, and productivity and profitability. Six of the top 10 chemical companies on the international market have their head offices in the EC.
- The European textile industry is regarded as slightly inferior in terms of competitiveness. However, the same profit level is attained with lower productivity, and European high-quality clothing suppliers are clearly superior to the Japanese competition.
- The European automobile industry does not achieve the productivity of the Japanese competition. Middle-market cars are less, although only slightly less, competitive. Profitability too is slightly below the Japanese level.
- European producers of consumer electronics, office automation systems and equipment, and electronic components are inferior to the Japanese competition and their dependence on supplies from overseas is increasing. European companies mainly lag behind

Japan in productivity and profitability. The lag in technological level and product quality is only limited.

- European suppliers of telecommunications systems are technologically advanced, and productivity and profitability match the Japanese level. They are highly competitive. In contrast, information technology is heavily dependent on external supplies, and particularly on American manufacturers for main-frame computers. On the whole, competitiveness is slightly below the Japanese level here.
- In the machine tool and building machinery industries, EC manufacturers and the Japanese suppliers are at about the same technology and profitability levels, whereas there is a slight lag in productivity. European companies show a particularly high level of technology and quality in large-scale plants.
- The European food industry is sufficiently competitive. It is difficult for an outsider to enter the market because the multinational concerns operating in this sector have already developed an omnipresent European distribution system.
- In the building industry, European companies are on a level comparable with Japan in terms of technological level, productivity, and profitability.
- Management support in preparing for and launching new operations in the subsidiaries;
- Coordination of European development, manufacturing, and marketing operations, ensuring that they are in line with the global strategy set out by the company's head office in Japan;
- Provision of executive services for the European subsidiaries (logistics, information, personnel, legal affairs, coordination of public relations work in the broader sense);
- Controlling the company's entire involvement in Europe.

The European headquarters are financed out of contributions by the subsidiaries for managerial services, allocations from company headquarters in Japan, or financial transactions of their own.

The European headquarters also control the Japanese companies' business in central and eastern Europe, only business with the USSR being handled directly from Japan. There is particularly strong interest in the CSFR, Hungary, and Poland, both as sales markets and as industrial partners. Interest in Romania and Bulgaria, on the other hand, is merely secondary.

In the light of its study, the Industrial Bank of Japan assumes that direct investment by Japanese companies will further increase once the single EC market is established. The ground that Europe needs to make up requires considerable technology transfer so that products for industrial mass production of automobiles, consumer electronics, and electronic components may be developed. The bank explains that this technology transfer will take place through the transplantation of key manufacturing operations, the establishment of R&D and design centers, and the development of efficient suppliers.

A Nomura Research Institute survey of how Japanese companies operate in Europe defines three business policy and organizational goals pursued by Japanese companies:

1. To establish a "fully integrated presence as EC insiders" ranging from research/development and design via manufacturing to Europe-wide coordinated marketing and the creation of efficient customer service systems. The purpose of having development and manufacturing operations is to create original European products that can be marketed worldwide.
2. To organize efficient sales, Europe-wide inhouse information exchange, and accounting systems.
3. To bring on staff that can be assigned throughout Europe.

In the course of their intensive European involvement, Japanese companies establish new European headquarters or expand existing ones to perform four tasks in particular:

Some Japanese companies prefer to enter central and eastern Europe from bases in Germany, especially in the new federal laender. However, other companies regard Vienna as the best base for their business in Poland, the CSFR, and Hungary, all of which is of a long-term nature.

The firms that the Nomura Research Institute cites as exemplary implementers of an effective European strategy include Matsushita Electric Industrial Co. Ltd., Mitsui & Co. Ltd. general trading company, Kyocera Corporation, which produces industrial fine ceramics and is also extensively engaged in optics and information technology, Omron Corporation, which manufactures measurement, control, and information technology systems, and the building machinery manufacturer Komatsu Ltd.

- Panasonic Europe (Headquarters) Ltd. in the United Kingdom, which was incorporated towards the end of 1988, acts as central command for Matsushita Electrical Industrial's European operation. With a staff of about 80 employees (50 percent Japanese), it manages a total of 32 European subsidiaries covering sales (11), production (17), R&D (two), and finance (two) with a total income equivalent to about 4.8 billion German marks [DM]. The chairman of this company has a seat in the parent company's top management in Japan as head of the Europe/Africa division.

The European headquarters' work falls into five areas: corporate planning (including public relations work and the direction of European consultants), management (including accounting), personnel (including personnel development and training), marketing/sales for overall control and support of the individual companies, and



manufacturing (supporting the individual companies) and control of R&D work (most of which is currently performed at Office Workstations Ltd. and D2B Systems Co. Ltd. in the United Kingdom) via a future Technical Center/Europe.

- Mitsui & Co., one of Japan's top general trading corporations, set up Mitsui & Co. Europe Ltd. in the United Kingdom back in 1974 as its European headquarters, which now controls nine subsidiaries and 23 representatives (nine in central and eastern Europe and 14 in Africa). However, the European subsidiaries' holding company is Mitsui & Co. International (Europe) B.V. in the Netherlands. The head of the European headquarters is a member of the Japanese parent company's board. Just 25 of the European headquarters' 30 or so employees come from Japan. The trading company's total European sales amount to the equivalent of about DM45 billion.

The organizational structure covers all areas of a corporate headquarters, and has a "product/merchandise monitoring department" that is worth a mention. Its job is to ensure strict compliance with the global product/merchandise strategy developed by the general trading corporation at its Japanese head office.

Late in 1988, Kyocera set up Kyocera Europe GmbH in Germany as its European headquarters controlling the operations of eight sales subsidiaries in Europe. In Germany these are Kyocera Fineceramics (formerly Feldmuehle Kyocera Europe Electronic Components), Kyocera Electronics Europe, and Yashica Kyocera with subsidiaries in Austria and Switzerland. New acquisitions ELCO Electronics GmbH and AVX Ltd. represent an additional involvement in Europe. The European headquarters, which primarily fulfills a supervisory and support role, has a staff of seven.

The projects handled by the European headquarters include launching ceramic tools onto the market, setting up a production base for laser printers in France, and taking over the former joint ventures with Feldmuehle. In addition, this base is engaged in drawing up medium-term European strategy (sales, investments, personnel), coordinates European price policy, and is responsible for devising an inhouse information and reporting system in Europe.

- Omron Corporation's European headquarters, the Omron Management Center of Europe B.V., was set up in the Netherlands at the end of 1988. Three Japanese employees coordinate the operations of 22 subsidiaries. These are mainly sales companies covering process control, sales and accounting systems, medical technology, and office automation systems, although they also include two manufacturing and one finance company. Total European sales amount to the equivalent of well over DM0.5 billion. There are plans to expand this base into a fully-fledged European headquarters over the next few years.
- At Komatsu Ltd. the European business of its five

subsidiaries (manufacturing bases: Hanomag AG and Komatsu UK Ltd.) is coordinated by N.V. Komatsu Europe International S.A. in Belgium (five of the eight employees have been seconded from Japan). Total sales in Europe amount to the equivalent of about DM1.3 billion, approximately half of which is produced in Europe. Routine business is coordinated at monthly conferences on the basis of a revolving production and sales program that is largely established at the local level. Six managerial committees representing the subsidiaries also play an important role in coordinating business policy; they cover material procurement/purchasing, product planning/design, manufacturing, marketing/logistics, accounting/finance, and the information system (the latter's task being to organize an inhouse data and information network).

### **Persistent Difficulties Force Bull To Adopt Strict New Restructuring**

#### **Reduced Work Schedules**

91WS0156A Paris 01 INFORMATIQUE in French  
11 Jan 91 p 3

[Article by Annick Le Berre: "Gnashing of Teeth at Bull"; first paragraph is 01 INFORMATIQUE lead]

[Text] In Angers, the reaction was one of bitter irony; in Belfort, one of outcry. Coming in the wake of its transformation plan, Bull's announcement of partial shutdown measures at these two sites has angered workers. However, management is downplaying this second blow, arguing the constraints of the transformation plan.

"We were supposed to become a world-class printed circuit production center, but with production approaching zero (...)." The partial shutdown at Bull's Angers plant is an incomprehensible paradox in the eyes of the workers, who were stunned by the announcement. Favored by the group's transformation plan, the Angers center, which specializes in printed circuit boards and computer assembly, is one of six production sites scheduled to remain in business, while seven others will be eliminated. Now, owing to a shortage of orders, the plant will be sending a portion of its staff home one work day a week from 14 January through the end of the month. These provisions only affect production workers and technicians, or 1,654 employees out of a total staff of 2,556. The fact that managers and management-level employees, who are salaried, have been spared by these measures adds to the ambient bitterness. "Bull's slogan is 'team spirit.' What team spirit? Production is always the first to pay!"

Still, no one in the unions denies the decline in production volume. While production capacity at Angers is 1.3 million work hours, production forecasts for 1991 are for less than 700,000 hours. "In the sector, the first quarter is always flat, so the problem is partially seasonal," according to Bull management, which is downplaying the situation. "Before,



we could spread the production load over the year and avoid measures like this. Those days are over. You must not forget that Angers has changed businesses. The plant is no longer producing only for proprietary systems, but for UNIX systems and microcomputers as well." The short-term visibility of these two markets requires greater flexibility and tight production flows. Indeed, adapting to new market constraints was one of the imperatives of the transformation plan.

#### All-Out Effort To Restore Production Volume

The workers are concerned that implementation of the transformation program may be delayed. "Patience," management replies, "this temporary decline in production activity at Angers should disappear with the transfer of a portion of the production activities from the Joues-Tours site." Unfortunately, a buyer has yet to be found for the Joue plant.

Meanwhile, Angers is trying to restore production volume. Some subcontracted work will be brought back in house. Bull also has its hopes on Bull Circuits imprimes (BCI), the small division responsible for attracting foreign clients. In December, BCI managed to land a big contract for the fabrication of a large number of sophisticated printed circuit boards for Teradata's data base machines. Opportunity could knock again. "So why did we refuse Sagem's proposal when it was looking for a manufacturer for the Canal Plus decoders? We had the know-how," the unions say. "We would not have been able to meet the deadlines for either plant investment or production," management replies. "Besides," it adds, "that offer, which was made in August, would have forced us to work around the clock at a time when the night work agreement had not been reached." The decline in production volume threatens to put this agreement on hold—unless there is an improvement. Judging by the postponement until 31 January of the decision on whether to continue short work hours, the hope is that it will come in February and March.

The Belfort unit has not had the good fortune of a grace period. Its fate for the entire quarter has already been sealed. The plant will close from 21 to 29 January and for seven to 10 days in February and March. The shutdown will affect all staff, without distinction. For Belfort's 1,500 workers, this was the last straw. The reaction was not long in coming. Before the meeting of the work's council at which the partial shutdown measures were to be officially announced, the interunion committee (representing the CFDT [French Democratic Confederation of Labor], the CGT [General Confederation of Labor] and the CGC [General Confederation of Management Personnel]) called a 1-hour work stoppage. Observed by over 1,000 people according to the unions and by 600 to 700 according to management, the work stoppage was supplemented by a motion demanding the suspension of the measures. The CFDT and the CGT made discussion of the motion a precondition for the council meeting. When refused, they walked out. The CGC broke ranks with the boycotters. "We wanted management to hear our point of view,"

Pierre Leprince, one of the CGC representatives, said. "To our knowledge, there has been no attempt to find another solution, such as initiating talks on adjusting work hours, for instance." The CGC criticizes these measures as "consistent with a strictly short-term economic perspective" and would have preferred "the socially less painful solution of early retirement."

#### Printers Desperately Seeking Partner

The fact is that the partial shutdown will cost Belfort workers dearly. It comes as a heavy blow to these people, who have already been badly treated by the transformation plan. Bull, which has decided to get out of printers, Belfort's specialty, wants to make the division a subsidiary and has been looking for a partner. "Yet the printer market is a strong market that is making a lot of money for our competitors," the unions say. "It would be strategically illogical for Bull Peripheriques to leave the group."

Management maintains a firm stance and is continuing its search for a partner. "This partner is like the lady from Arles. People talk and talk about it, but nobody ever sees it," union official Gilbert Guilhem said with bitter irony. Indeed, candidates for partnership, whether with Joue or with Belfast, are proving most elusive. It decidedly appears that Bull will be forced to bear the cross of its chosen gamble for survival. These partial shutdown measures look very much like the obligatory dodges of a lone warrior.

[Box, p 3]

#### Olivetti, Too

Olivetti's unions are showing their teeth. Backed by the threat of strike, they are opposing management on the need to resort to a layoff plan at the Ivrea firm. As part of its restructuring, the Italian computer maker plans to lay off 2,500 workers and cut work hours for 1,000 others, who will be brought in on a part-time, rotating basis.

Meanwhile, the government has decided to permit 3,000 employees (out of the 3,500 jobs to be eliminated) to opt for early retirement. What is more, a statutory order will be practically tailor-made for the occasion. The order will declare the Italian computer industry a crisis sector with the concomitant advantages, as was done for the steel industry. Buoyed by the announcement of the social safety net to be extended to Olivetti, the unions are contesting the need for layoffs. Management says that it is prepared to resume talks on 21 January.

#### Other Alternatives

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[Article by Annick Le Berre: "Bull: Forced Celibacy"; first paragraph is 01 INFORMATIQUE lead]

[Text] Is Bull to be wed or even—why not—sold? Some have suggested the Francis Lorentz' transformation plan was aimed at more than simply getting the company

back on its feet. Still, the government would have to agree to abandon its national champion, and there would have to be suitors.

September 1990, November 1990—for the space of a few months, Bull has been awash in rumors. In September, Industry Minister Roger Fauroux mentioned that Bull would do well to seek an alliance with other European partners. He openly cited Siemens and Olivetti. The minister even added that if the partner in question were to apply, Bull could follow the example of Renault and Volvo. Rumors immediately began to fly. Saying that a foreign partner may be allowed acquire an interest in Bull is tantamount to saying there will be government divestment. Why not total divestment? After all, Bull's history encourages this type of prognostication. The repeated scenario of the company's sale, first to General Electric and then Honeywell, might be in for a remake.

#### No Less Than Seven Layoff Packages in Seven Years

November. Bull's CEO Francis Lorentz introduces the group's transformation plan. While he acknowledges the need to form alliances, he clearly stipulates that he has not received any mandate to sell Bull and, in any case, that the decision is up to the shareholder (the government), which, for the time being, does not appear to have this in mind. Case closed? Not entirely. Rumors, we know, die hard—especially when they feed on the life of a nationalized company. It would take more than a minister's words to kill these. The reason is that Bull's recovery plan is the product of a new context. Still, this is not the first restructuring plan for the "French" computer champion. It has been through no less than seven layoff packages in seven years.

However, this time, things have changed. The new plan is one of a now international group. Moreover, it comes at a time of global restructuring that is affecting almost all computer makers, particularly the European firms, which are among the hardest hit. In this setting, the new restructuring plan appears in a different light. Of course, its first objective is to restore the profitability of the group, which registered losses of 1.88 billion francs for the first semester. Francis Lorentz has set an early deadline, 1992. To meet it, he will have to make tracks and accomplish in two years what had been scheduled for four; hence the draconian measures. These measures will involve not only restructuring the European organization, but also selling off sites, getting out of peripherals, and eliminating 5,000 jobs. At first glance, the decisions all appear to have been based on solid business reasoning in an effort to respond to the urgency of the situation. However, in France, where government-owned companies are concerned, the line between business reasoning and political reasoning is tenuous, if not symbolic. Bull's short-term recovery plan is highly unlikely to be an exception to the rule.

Is the strategy to maintain a French computer industry, come hell or high water, or, as some have suggested, is it to make Bull more attractive, the better to marry her off?

#### Becoming Competitive Now

In any case, with a European computer industry hesitating between convulsive activity and lethargy, Bull seems to have gone for the stubborn strategy of fighting to the bitter end. The less scrupulous Philips has sold off its computer hardware business. The British computer industry is in tatters. The ailing Olivetti is also laying off. And Siemens is concentrating on digesting Nixdorf. It remains to be determined what the real goals of this for-now solitary battle are.

The theory that the French group's position is being improved in order to make it saleable is scarcely sound. Pierre Audoin, who heads PAC, a computer strategy consulting firm, notes that "although the French government has often changed alliance strategies since the sixties, the emphasis, regardless of the party in power, has been on the need for a well-established French computer group." The sacrosanct principle of independence has not been the only issue. "This resolve was based on the chain-reaction principle. Abandoning the computer industry would have placed the other industries that used computers in a difficult position. This option would have put an end to European expansion and sounded the death knell of exports."

However, given the current economic environment, this strategy of independence may be up for redefinition. "There are reportedly two opposing arguments at the Ministry of Industry," according to Bertrand Lebel, an analyst for IDC. "The first is supposedly based on preserving independence, but would reduce costs and implement a more privatized, autonomous structure. The second is said to start with the principle that the hardware sector is ultimately doomed and that it is better to focus on software and services instead. The goal is to become more competitive now in order to counter future Japanese proclivities in this area." The first option has in fact won out. By approving Francis Lorentz' plan, the ministry has encouraged Bull to stay in the running and to work on its means of survival—at least for a part of its business. The French group has already begun to move out of a number of areas (printed circuit boards and disk drives) and has confirmed this choice in its new plan by seeking to pull out of peripherals in Belfort.

This shift in focus has several points in common with the strategy adopted by ICL [International Computers Limited, London] a few years back. Prior to its buyout by Fujitsu and well before Bull, the British firm restructured and reduced the number of its activity sectors. However, the comparison ends there. While the Japanese firm did find a group that was already on its feet again, its primary interest was to secure entrance into the sectors targeted by ICL: banking and big distribution.

In contrast, Bull remains a general manufacturer, despite its efforts to sell off some operations. According to Bertrand Lebel, "Its problem is one of dispersed product lines and expertise. Also, because of its growth, Bull has

become a complicated group. Who would want to buy a hydra?" The buyer would have to have a purse to match its purchase, unless it proceeded to buy the company piece by piece. But, here again, where are the possible candidates? The mainframe market is winded, and Bull's mainframe line is unlikely to arouse desire, especially since its market—essentially civil service and local government—is already under attack. Its UNIX line is also problematic, as it is multiple-processor-based. However, despite its difficulties, Zenith could be a choice morsel "for a manufacturer like Hewlett-Packard, which has problems on the American PC market," Bertrand Lebel suggests. "Another possible candidate is DEC, which does not have a micro line."

However, the IDC analyst does not put much faith in this speculative game. There is a big difference between drawing up a list of possible predators and seeing it confirmed. In the case of Zenith, the operation is even unthinkable. Can anyone imagine Bull regurgitating such a prized prey, and one that it has so recently swallowed?

So Bull is apparently neither saleable nor, in any case, for sale—and certainly not now. "The Bull problem is a political problem," according to Bertrand Lebel. "The government has been involved in the creation of a computer plan for nine years. Nobody wants issue a report card on it before the next session of Parliament, if not the next presidential term."

In contrast, the partnership angle has all the marks of necessity. Bull recognizes that it is no longer possible to do it all, all by yourself. The question is who to work with. A domestic alliance would be an excellent arrangement. "This type of solidarity is vital," according to Pierre Audoin. The problem, in France, is that the entire electronics sector has the hiccups. Some think that it would be a good idea tie the ailing Bull and Thomson to the well-filled coffers of France Telecom. However, France Telecom probably prefers to manage its finances carefully, with a view, for instance, to parrying the impending danger of competition from the recently formed IBM-British Telecom tandem. Saddling SGS-Thomson with Bull is not a possibility, either. When questioned, the Franco-Italian manufacturer said that it could see no advantage in the alliance: "SGS-Thomson does not produce microprocessors that can be used in microcomputers, any more than it produces the DRAM [Dynamic Random-Access Memory] memories Bull needs."

### A Fight to the End

For the time being, an agreement with another European firm seems just as improbable. The case is closed with Olivetti, and it is hardly current with Siemens. Moreover, the issue does not seem to weigh heavily on the mind of Bull's stockholder, which is more concerned with pressuring Philips. For the time being, France has a single concern when it comes to partnerships: seducing the giant Eindhoven—with the help of the video recorder scheme—in order to keep it in the European camp on HDTV (high-definition television). Consumer

electronics and semiconductors are top priority. Once again, French sights are on Philips. France hopes to keep the Dutch firm from landing in the Matsushita camp. It would obviously prefer an alliance with SGS-Thomson. Meanwhile, if there is a European alliance, it will not be with Bull. In the absence of this alternative, is the Japanese option still viable?

The name of NEC comes up regularly. The Japanese firm, which holds a 15-percent interest in Bull HN, might possibly consider modifying the terms of its participation. It would have an opening to do so if the operational merger of Bull HN Italy and Bull HN Great Britain provided for in the transformation plan were to be complemented by a legal merger. In that case, it would be necessary to provide some kind of compensation, which might take the form of interest in Bull SA. This, too, is pure speculation. NEC scarcely seems tempted by this option. The Japanese firm would rather keep its interest in the subsidiaries, one of which—the Italian—is the group's most profitable.

Moreover, legal merger is not under consideration by Bull management.

With no partners in the offing, Bull will have to fight its own battle. After all, in the words of Francis Lorentz, the purpose of the transformation plan is to place the group "in a position to survive." The Cassandras are already announcing its defeat. "Don't shoot the ambulance," Bertrand Lebel replies. "Bull still has technological assets like the DPS 7000. It has an installed base and the Zenith portables. If its retrenchment program has enough bite, it may pull it off." According to Pierre Audoin, "Bull has never been able to implement this type of plan because of its status as a government-owned company. It has a chance to make up for lost time. Even then, we are talking about indispensable, minimum measures."

It seems, though, that the worst is not over. "A worst case scenario is possible," Bertrand Lebel cautioned. "But if another European firm were to disappear, it would probably be Olivetti, not Bull!"

### SGS-Thomson Plans To Stop IC Production in France Described

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in French 10 Jan 912 pp 1, 8

[Article by J.-P. Della Mussia: "Chip Production at Rousset in Jeopardy"]

[Text] SGS-Thomson declines to confirm it but the facts speak for themselves: The French-Italian firm has practically discontinued investing in its main French integrated-circuits [IC] plant, based in Rousset, near Aix-en-Provence. Considering the relative age of the technologies in use there—1.2 microns on 4- and 5-inch wafers—the onset of Rousset's obsolescence can be put at around 1993, with the economic consequences this will entail. That date, if nothing is announced between now and then, will also mark the abandonment of all

ambitions in respect to very large-scale production of CMOS IC's on French soil and under the impetus of French initiative (the "Grenoble 92" project is barely at the "big laboratory" stage). Matra MHS, 50-percent owned by Matra, which bases its activity at Nantes, will be left to stay the course alone, but with a revenue of 500 million French francs [Fr].

This development is not really a surprise: SGS-Thomson has 18 production plants throughout the world. That is far too many. Since neither the French market nor French know-how can justify the presence of a giant plant in France, only wage and salary costs and regional and/or national subsidies can be called upon to provide the rationale. On these counts, Rousset is, in fact, disarmed against the Italian plant at Agrate as regards subsidies, and against the one in Singapore as regards long-range wage and salary costs.

Today, the Rousset plant employs 1,050 persons and covers 40 percent of SGS-Thomson's French production of semiconductors.

#### Eventful History

The Rousset plant was originally owned and operated by Eurotechnique, a jointly-owned subsidiary of National Semiconductor and Saint-Gobain, formed in connection with the first IC plan of 1978. From the outset, its orientation was large-scale production of MOS circuits. Its staple products: EPROM's and microcontrollers. In 1982, following the nationalizations, National Semiconductor found itself compelled to sell its share, and Thomson had to buy it, Saint-Gobain having been enjoined to "revert to its basic fields of specialization." The taxpayer thus had to finance this operation. Practically speaking, no investment was made that year. Lean years followed, for the personnel and for the financial stability of the operation. No real large-scale production know-how using modern technologies could be developed.

The arrival of the "Italians" in 1987, following the creation of SGS-Thomson, proved highly beneficial for Rousset: Not only did production skyrocket, but the personnel recovered their "pre-1982" motivation (see *ELECTRONIQUE HEBDO* 15 September 1988). It is common knowledge that the quality of products coming out of Rousset is very satisfying.

The investment plans being talked about by the management were still, as of the beginning of 1990, suggestive of a bright outlook: The 4-inch production lines, currently being transferred to Singapore, were to be replaced at Rousset by 5-inch lines so as to raise output to 8,000 wafers a week. This expansion of the Rousset plant was to involve an investment of around \$100 million. But none of this has happened.

On the contrary. A few weeks ago, it was decided to transfer Rousset's entire EPROM management staff to Agrate in Italy, a plant whose 6-inch/0.8 micron EPROM technology, on the other hand, continues to figure in investment plans to the extent of \$100 million. Malicious

French gossip has it that it is the Italian government who foots the bill. In addition, the production of microcontrollers, which represents a substantial part of Rousset's activity, is being managed out of the Grenoble plant by Philippe Getres, who was recently appointed to that post. Responsibility for multichip circuit boards has been transferred to Agrate. The fact that the Singapore plant's production of 4-inch and 5-inch wafers is scheduled to be increased from its level of 50,000 wafers a week as of the end of 1990 to 100,000 a week by the end of 1991 is another cause of anxiety on the part of the personnel at Rousset.

#### A Transfer to Singapore

To date, only the transfer of a 25,000-wafer-per-month capacity has been explained and scheduled for 1991.

The latest development: As of the end of December, the management decided that procurement, accounting, and data processing for French plants will no longer be centralized at Rousset.

Suddenly, a little remark dropped in private by an SGS-Thomson finance manager has taken on particular significance: "To compete with the Japanese in CMOS circuits, all we need is two world centers of diffusion, each with a capacity of 250,000 wafers a month." And the company's personnel equate this with: "Agrate and Singapore." Moreover, in what other light can one view the joint CNET [(French) National Telecommunications Studies Center]/SGS-Thomson "Grenoble 92" project, set up under JESSI [Joint European Submicron Silicon Initiative], which could then limit its scope to research and preproduction development (officially, SGS has, for the moment, stated that its sole intent is to try to double the average revenue per production site)?

#### Franco-French Approach Is Finished

Over the past few years, the French semiconductor industry has suffered considerably. Today, in view of the magnitude of the problem, it is beginning to be abandoned: By the president of Thomson, Alain Gomez, who would like to see it become European (through an association with Siemens and Philips, although these two turn their deaf ear to this proposal); by Pasquale Pistorio, president of SGS-Thomson, who has transferred the decision-making centers for all product lines, except microcontrollers, to Italy; and by the government, which would prefer to channel the funds available to it into aid for the PME's [Small and Medium-sized Business(es)]. The fact is that hundreds of millions of francs would no longer suffice to revitalize the French semiconductor industry; the required figure would be rather in the tens of billions for quite a number of years. The price of two or three "presidential workplaces" D'Orsay museum style!

The French semiconductor is not definitively dead, but as things stand now, the alternatives are utterly simple: Either it must be integrated with ambitious European (or, as Mr. Pistorio also suggests, Franco-Japanese) projects; or it must occupy specific niches (ASIC's,

customized microprocessors and memories, analog circuits for consumer products). All else will amount to nothing other than the projects of foreign companies seeking a European plant for the sake of a trademark with a European image.

In any case, the Franco-Italian firm stands to suffer this year: The prices of memories are at their lowest; and as a result, the firm's losses in 1990 amounted to approximately 8 percent of revenue, which, for its part, rose 2 percent in terms of local currencies. Such results bode ill for 1991 investments in general.

### **French Executives View European Electronics Industry Competitiveness**

91WS0191B Paris *ELECTRONIQUE HEBDO*  
in French 10 Jan 91 pp 33-34, 36

[Article by Patrick Arnoux, Didier Girault, Michel Heurteaux, and Jacques Marouani: "The 10 Conditions for a Forward Leap"]

[Text] Can the worrisome situation and the even more utterly disquieting outlook that have been described in this issue continue to be viewed with resignation? Certainly not. The European firms have a number of winning cards to play and, above all, a number of obstacles needing to be overcome. What are they? How can they be overcome? Six of the sector's leading figures respond.

A talk with these top-drawer leaders of the electronics industry has enabled us to identify the most discerning approaches. Here, then, are the views of Roger Agniel, president of SITELSEC [Association of Electron Tube (and Semiconductor Parts) Industries]; Jacques Bouyer, president of GIEL [Electronic Industries Group]; Abel Farnoux, president of Electronics International Corporation; Bernard Giroud, vice president of Intel; Robert Heikes, consultant and former vice president of National Semiconductor Europe, cocreator of ES2; and Pierre Suard, president of Alcatel Alsthom.

#### **1. Attainment of World Critical Size**

Size, according to Robert Heikes, is the cause of all our ills: "The problem is extremely simple, and the proof is mathematical. In the semiconductor industry, research costs come to 15 percent of revenue, and investment in manufacturing equipment to 10 percent, representing, together, a fourth of all revenue. Each of the three leading Japanese firms has an annual revenue of over \$4 billion. Toshiba, for example, can thus devote \$1 billion to these investments. The top three European firms—Siemens, Philips, SGS-Thomson—with their revenues of 1 billion each, can only spend 250 million on development. How can you hope to catch up with the Japanese, across this gap of one to four? To do that, each European firm would have to invest more than its total revenue!

A simple extrapolation projects annual revenues of \$20 billion for Toshiba versus 4 billion for SGS, in 10 years. The gap will then be \$16 billion. To gain \$1 of market

share, one must invest \$2. This means that SGS would have to invest more than \$30 billion over a period of 10 years, or \$3 billion a year! How can it expect to do that? There is but one solution: merge the three European companies. The arithmetic is simple: The cost of restructuring would come to around \$2 billion. For five years, this new company would lose \$500 million a year. But in due time, you would have a company that would be of world size and profitable. Unless this happens, the European electronics industry will be dead within 10 years. The choice is between a few hundred layoffs today and thousands within a few years.

The semiconductor sector concerns the entire electronics industry. The computer, telecommunications, automation, and consumer electronics sectors are all dependent upon those manufacturers who supply their components to whomever they wish, whenever they wish, and at the price they wish. It is time, past the time, for the Europeans to wake up. But as for the future, Bernard Giroud thinks that the number of players in the arena will be a very meager few: "At this point, there is hardly enough room for two suppliers, three at most, of each major technology. With their highly fragmented market, the Europeans have left the field free to the Japanese. In the very high technologies, the laws of scale no longer suffice. An economic strategy is needed. The future belongs to enterprises that develop and solidly control a standard, by virtue of the quality and performance of their products. That is the key to domination of the market. The relative weakening of the United States has stemmed from a ridiculous liberalism that has compelled them to release whole chunks of their technologies to anyone wanting them. There are antitrust laws, for example, whose existence dates back to the imperatives of what was entirely another era. These laws compelled Xerox, which controlled the photocopier market in total, to abandon its patents to the public domain. After losing major shares of the market, Xerox is regaining them little by little. Its strategy is a veritable lesson in reconquest, based on new standards of quality of its products and services."

#### **2. Development of Inter-European Alliances**

In this respect, viewed on a world scale, it is at the level of the West as a whole that we must approach the problem, says Pierre Suard: "From a European standpoint, team-ups have already taken place. As for the future, there are shackles tied to the national images of this or that group, especially where the group is state-owned. This adds a further obstacle. The problem of components concerns the entire electronics industry. Is it good for the world economy to have Japan as dominant as it is, with market shares exceeding 80 percent in some domains?

"We have lost the war. The time now is one for exceptional measures: The European and American forces must be combined and given the necessary protection for a sufficient period to enable them to upgrade their technologies to the level of their Japanese competitors. In broad terms, unless the West succeeds in stemming the growth of Japanese influence over the next 10 or 20

years, it faces the risk of a confrontation. I can see no other solution to this incredible imbalance."

This analysis is comparable to that of Bernard Giroud: "To win the game, alliances must be formed at the level of the Western camp. If the United States is stronger, Europe will be stronger. The two must unite to do battle. Instead of forming an alliance with Mitsubishi, would Daimler not have done better to cooperate with an American partner?" Some, like Jacques Bouyer, still lean toward European solutions: "Merging our European resources—Philips, Siemens, and SGS-Thomson—in one way or another, would increase our chances significantly. We will not pull through unless these three firms cooperate more closely with each other in the major sectors."

An analysis akin to these is that of Robert Heikes: "If the European companies interested in HDTV [high-definition television] do not team up together, the Europeans are assured of total failure. The size of the European market is proof in itself that there is room for but one big company specializing in consumer electronics, one in telecommunications, and one in computers." Abel Farnoux, for his part, also argues with conviction for a strengthening of alliances: "In the strategic domain of components, the Europeans have a captive market that attains critical size, with size to spare; but they lack the necessary size in production. They control only 10 percent of world production, while European manufacturers in the electronics sector as a whole control 19 percent of the world market. If these manufacturers could agree to buy only components of European origin, the components manufacturers would have an impressive captive market: one fifth of the world market! All the manufacturers should form a club that would systematically give preference to European suppliers. Bull and Alcatel, as a matter of preferential policy, should buy components "Made in Europe." Franco-French groups can no longer stay the course: How can we expect to have sufficient scale with a market that represents only 3 percent of the world market?"

### 3. Implementation of Large-Scale Industrial Programs

Opinions on the virtues of the European programs are very divided. In Jacques Bouyer's view: "JESSI [Joint European Submicron Silicon Initiative] provides a good example of a pump-priming program. It is absolutely essential that we continue that type of approach. But the component-using industries must also become much more involved than they are today." Robert Heikes thinks differently: "These research programs are totally ineffective. Nothing can be expected to come from them: JESSI will fail. It is going to cost \$4 billion in six years; that is, \$500 million per year to be divided among three large and six small enterprises. Each firm will thus receive \$50 million a year. Clearly, this falls far short of the needed \$30 billion in 10 years. These programs nevertheless are useful in one respect: They accustom the Europeans to the idea of working together." Even if they do still have their faults, says Pierre Suard: "They are indeed positive initiatives, but they are still somewhat bureaucratic. Proposals for

Eureka, for instance, have to be presented by a consortium of firms of several firms. But these firms must not belong to the same group. Alcatel, for its part, with its subsidiaries, can offer a more effective structure than an ad hoc alliance of firms. The formula must therefore be improved, and it is not at all certain that the financial means are adequate to match the stakes."

### 4. Defining of Rules of Engagement for European Market

Who will profit the most from the model 1992 single market? Not necessarily the Europeans, says Robert Heikes: "Those who stand to gain the most from it are the Japanese and the Americans. The firms in those countries already consider the Old Continent a single market. They have structured their subsidiaries accordingly. But protectionist measures are not the proper responses. These measures always generate weakness." True, but certain measures need to be resorted to, says Roger Agniel: "We would like to see customs duties remain at 14 percent. That is not too high, considering that the dollar drops 15 percent in the space of a year. Only the Dutch and French governments support this position. In this respect, we are opposed to the computer industry lobby, which seeks the elimination of import duty so as to lower that sector's supply costs. We favor a number of antidumping measures: It is intolerable that prices in Europe should be the world's lowest, while the Japanese maintain very high tariffs in their domestic market. This enables Japan to build war chests of considerable size... and to destroy vast stretches of Western industry. The only admissible rule of engagement is reciprocity. Pierre Suard shares this opinion: "The European electronics industry's difficulties stem in great part from unequal engagement with the Japanese. This is owing, beyond any doubt, to a number of bad decisions the Europeans have made in the past, but it is also the consequence of the very different operation of the Japanese market. An example: The very same camera is retailed for 1,500 French francs [Fr] in New York, and for Fr2,200 in Tokyo. The disorganization of the system is evident when products are sold cheaper in big export markets than on the domestic market. In Europe, these practices run counter to the philosophy of the single market. I do not favor the putting in place of protectionist measures, but we must not be naive. I simply ask for reciprocity in the rules of engagement; that is, that the competitive advantages our markets offer to nondomestic manufacturers be reciprocated on the domestic markets of these manufacturers. The Japanese telecommunications market, for example, is inaccessible to enterprises such as our own. An incredible *de facto* protectionism exists in Japan, that must spur the Europeans to react accordingly." Abel Farnoux's view does not differ greatly: "We are building a Europe that has not yet defined its market's rules of engagement vis-a-vis the United States and Japan. They must be laid down simultaneously with our quest for competitiveness."

### 5. Instituting of European Norms

Some, like Roger Agniel, militate for speedy adoption of common norms: "Our associations are advocating the putting in place of the CECC [European Communal Credit Community] norm. We fully intend to develop it and see to its adoption. The Americans protect their domestic market with a manufacturers "type-approval" system. If you are not listed among the approved, you find it impossible to sell in the United States. In Japan, it is especially difficult to market components." Pierre Suard recommends that these much-discussed European norms be accompanied by very detailed and clearly spelled-out conditions: "The standardization of norms makes Europe a real single market. But the realization of this market is all too often viewed as synonymous with the opening of its doors to the outside world! Until now, our competitors from other continents have operated in the Old Continent in a market that is fragmented among 12 countries. They have thus had to invest twelvefold. In the case of a single market, the opening of borders is a suicidal wish. It can bring about the disappearance of entire sectors of our industries. The fact is that the emergence of an economic Europe has preceded that of a political Europe, which, for the moment, and strangely, lacks clout. That is our great weakness." So, is the solution to be found in Brussels? Bernard Giroud is not far from thinking so: "It all boils down to taking a long-term strategic view aimed at instituting "Japanese-style" solutions. The European Commission must therefore be enabled to provide orientations based on genuine European standards, designed to make competition more difficult for the Japanese."

### 6. Mastery of Semiconductor Production Tools

A handicap that is often underestimated, says Abel Farnoux: "Japanese supremacy in the domain of machines for the manufacture of semiconductors is incontestable. The other manufacturers are therefore at the mercy of their decision to deliver or not. Thus Philips, which is conducting research on flat panel displays, is compelled to design its own production machines, because the Japanese refuse to sell them. In this way, much of the Europeans' research depends on the good will of the Japanese. And therefore, it is the entire chain, from the conception to the production of the end product that must be mastered." Robert Heikes thinks differently: "I do not agree. Europe's technology is excellent. The Japanese have a certain lead, but the Europeans have the technological means for competing with them."

### 7. Remedying of the Dearth of Competence

Industrialist Pierre Suard is confronted by this phenomenon: "We unquestionably have a serious lack of engineers; but what is most disquieting is the poor functioning of the national educational system, with the waste that characterizes it." Roger Agniel fine-tunes this analysis: "The phenomenon of a rarefaction of CAD [computer-aided design] specialists in France indeed exists and is disquieting. But how widely known is the

fact that many faculty positions that have been budgeted for and created are going unfilled because of a lack of interested candidates? Salaries are considered not sufficiently attractive by comparison with those being offered by private industry. We have pressed suggestions for making use of many specialists as they retire from jobs in private industry, but rules and regulations preclude their being offered this possibility." Abel Farnoux proposes an original solution: "Our shortage of engineers is crucial. We should import some, especially from Eastern Europe." These thoughts differ substantially from those of Robert Heikes: "In Europe, young people no longer want to devote their efforts to research, owing, very simply, to the lack of positions for lack of funding. If the financial means are forthcoming, everything is possible."

### 8. Mobilization of Greater Financial Resources

"The fact is that prices of admission for these industries have become astronomical," says Jacques Bouyer. "They run into the tens of billions. For the development of HDTV, for example, a very-long-term view is needed, with sufficient means of financing to enable the deferral of returns on investments. But money is not the entire story. One must have a strong faith, morale, and the bearing of a conqueror."

Money is the mainstay of war, says Roger Agniel: "In the domain of semiconductors, the drain on the treasury is very substantial during the period between the investment in a production unit and the points at which it becomes viable, without counting the sums that must be mobilized to build the plant—on the order of \$1 billion for DRAM's. This is why a manufacturer of components must necessarily team up with a big group. Only big groups are able to take on the challenge of these mammoth financial requirements. It takes substantial European financing to figure within the technological lead platoon. Mind-boggling though Brussels may consider these sums to be, they do not exceed the sums mobilized by the big American and Japanese groups."

### 9. A Close Watch Over Wage Costs

According to Bernard Giroud, this parameter has become negligible: "With the very extensive automation of production, this is no longer a problem. The ratio of labor to the total cost of production of microcomputer equipment does not exceed 10 percent, while that of transportation costs can be as high as 3 percent."

That is not really Jacques Bouyer's opinion: "It is very definitely our handicap number one. We have the privilege of possessing the world's most sophisticated socio-economic systems, and abandoning them is out of the question. But in Asia, people work more for less. In this context, if the EEC does not take this differential into account, transportation costs being insignificant, plants will end up being installed elsewhere other than in Europe. At that point, this will become a veritable marketing jungle, where market shares will be fought for.



What is at stake is the survival of an entire manufacturing industry controlled by the Europeans, and the continuation of a type of society. The solutions are very difficult to put into movement. But it is within the realm of the conceivable to think of instituting protective measures until such time as these other countries have in place systems of social protection comparable to ours, and hence identical wages."

Abel Farnoux makes short shrift of this argument: "It is altogether a mythical monster used to justify production outside of France. In Germany, wages are decidedly higher than in France, but that does not prevent the Germans from exporting to the whole world."

#### 10. Development of Highly Integrated Companies

The electronics industry is necessarily very interleaved, says Jacques Bouyer: "Europe cannot do without an independent source of components for its defense electronics. The development and production costs of such components must necessarily be amortized by large-scale production for the civil sector: consumer products, computers, and telecommunications. In computers, our situation is not all that glowing, although in consumer electronics we can still play on the same courts as the big ones, with Philips and Thomson, which represent a quarter of the world market." Integration, yes; but not just any old way, warns Bernard Giroud: "Integrations are advantageous only if their structures function correctly. Philips possesses all the capabilities necessary to succeed in what is now the best-selling product: the small portable computer. This product demands expertise in miniaturization, packaging, and LCD flat screens. Owing to its consumer products division's manufacturing of compact disk players, Philips has these know-hows. But it has assigned its microcomputer project to its computer division, which specializes in minicomputers and mainframes. And what it is offering is nothing more than conventional personal computers. Instead of cooperating, Philips's different divisions ignore each other, with the results of record. Similarly, Thomson is much better equipped for mass production on a large scale than Bull. What is called for at this juncture is speedy production of these small computers. The fact is that, today, the entire computer industry is dominated, insofar as hardware is concerned, by the semiconductor industry. By the year 2000, simple extrapolation predicts that a microprocessor will be more powerful than a VAX microprocessor or an IBM 370. Rare are those who have grasped the significance of the technological revolution of the 1980's. Prior to that, each manufacturer offered his own architecture and his own specific technical solution to a more and more captive clientele. Half the computer engineers at that time were employed to transpose, adapt, and transfer customized applications from one system to another.

"With modern microprocessors, which have brought about compatibility of hardware, everything has changed. Compatibility has reduced hardware to the status of the commonplace. After a period of inertia, customers, who only yesterday were the 'prisoners' of

their suppliers, now find that they have options other than this enforced loyalty. And this has produced an upheaval in the computer hardware manufacturing sector, which has undergone a radical transformation. Some manufacturers are still building 'blast furnaces' in the era of aluminum.... In 1984, 170 chips and several memories were needed to manufacture a PC AT; today, it is being done with 10 chips and a few memories; and by 1993, two will suffice. Nixdorf paid dearly for its refusal to take these transformations into account. Its plants were capable of manufacturing machines at a price of \$50,000 each, while those being sold on the market cost between \$2,000 and \$5,000 each!" Abel Farnoux, for his part, points to the American scenario: "The examples of two companies that have succeeded—AT&T and IBM—show that the integrated production of semiconductors is indispensable."

#### French Firm Transfers Activity to Microelectronics

91WS0202A Paris INDUSTRIES ET TECHNIQUES  
in French 25 Jan 91 p 13

[Article by Y.C: "Betting Everything on Microelectronics: Micro-Controle Sacrifices Its Mechanical Division]

[Text] Micro-controle has pulled out of the race—the better to run next time. It is taking a tremendous chance. In order to finance its development in a high-risk niche—microelectronic instrumentation—the company (650 people, revenues of 450 million French francs [Fr]) is selling its micromechanics division. The new company will be based on participation in an Esprit program and on contacts within the JESSI [Joint European Submicron Silicon Initiative] project. It plans to be present, inspection side, in the race for the 64 megabit memory.

Micro-controle CEO Jean Delage is staking the fate of his company on a conviction: that the Europeans will win the memory race, which means that instrument makers will prosper. "For this new game, we needed Fr100 million," he said, "but no bank was willing to bet on microelectronics. They were wrong. The new company, which we may call MCI (Microelectronic Instrumentation), will be making money next year."

This company is not starting from scratch. "Siemens, IBM, and SGS Thomson buy our machines, and we already have earnings of Fr100 million a year. We have worked with one of the major French players in JESSI—LETI [Laboratory for Electronics and Data Processing Technology]—on IDIS, an automatic inspection machine. We are participating in an Esprit program, in which we are working with our Dutch counterpart ASM on the robotics portion of a photostepper for 64 megabit use. One of our machines has even received the JESSI label.

Above and beyond taking a stance, it took courage to try this new adventure again. And, courage is something Jean Delage does not lack.



**Germany: Siemens R&D Projects Outlined***91MI0179 Duesseldorf HANDELSBLATT in German  
25-26 Jan 91 p 19*

[Text] Siemens AG, of Munich and Berlin, is one of the most research-intensive companies in the Federal Republic of Germany.

To be able to offer innovative products and systems competitively on world markets, the company must have timely access to key components and control over technology used to produce them, stressed the board.

In the last financial year 1989/90, Siemens spent 7 billion German marks [DM] (DM6.9 in the previous year) on research and development. Some 43,000 employees (41,000 in the previous year) worldwide were working on these investments in the future. The 15 Siemens divisions undertake about 90 percent of research and development, and the two central divisions, research and development and production and logistics, account for about 10 percent. Apart from customized developments, by far the majority of the research and development costs were borne by the company itself.

The proportion received out of public funds was just three percent. The chairman of the board, Dr. Karlheinz Kaske, said that Siemens would spend rather more on research and development in the current year. An analysis of some 300 sectors of business had shown that further technical development depended primarily on progress in 30 technologies. Most of these core technologies were applied in several business fields and sectors. Siemens is therefore concentrating 95 percent of its research work on these areas.

A typical example of key components, for instance, are sensors, which are used in both medical and automobile technology. Specific components for them are being developed in the research laboratory in Erlangen. Future information and data systems will have to transmit datasets of increasing size. The key components for this purpose are the semiconductor lasers that convert electrical signals into optical signals for transmission by waveguides.

The new gas turbines developed by the power generation division (KWU [Power Station Union]) are an example of overlapping between material development and production engineering. The Siemens research laboratories are developing extremely fast laser diodes that can be very easily tuned over a 14 gigahertz bandwidth.

Siemens is also working on hydrogen extraction from solar energy in a demonstration plant in Neunburg v.W. From as early as 1991, Siemens hopes to be able to acquire experience there regarding the efficiency, reliability, and ageing rates of the individual components that make up the overall system. Siemens Solar GmbH, Munich, is supplying one of the two solar generator fields, while the power generation division (KWU) is one of the companies supplying the electrical equipment for solar current conversion.

Siemens is working with a total of more than 150 universities worldwide so as to integrate its research into international scientific development. One of the major joint research and development projects is the joint development of the 64-megabit memory with IBM.

**Italy: Pirelli Reorganizes Company Structure***91MI0232 Milan FATTI E NOTIZIE in Italian Feb 91  
p 3*

[Text] As of 1 January 1991, all the manufacturing and commercial activities of the cables sector will converge into a worldwide holding company based in Milan: Pirelli Cables S.p.A. [Incorporated], the new name of the Pirelli Cables Company S.p.A.

Giambattista De Giorgi has been appointed president and Gabriele Maschia managing director of the holding company.

The industrial and commercial structure of the former Pirelli Cables Company and the companies it controlled will form the Italian division of Pirelli S.p.A headed by Vittorio Pasturino, managing director.

Furthermore, the European, management division started operating as of 1 January 1991, headed by the managing director of Pirelli Cables S.p.A, Francesco Strada, who is in charge of European manufacturing and commercial activities.

**Why a Holding Company?**

The new organizational and corporate structure aims at continuing and developing the activities of the cables sector. The basic goals that the company intends to pursue concern the fields of research and development, product management, and European management primarily.

**Research and Development**

This strategically important function is currently undergoing a phase of increasingly intense and far-reaching commitments involving both traditional and new products and technologies. The cables sector therefore felt the need to reorganize and enhance the management of this division, which has five highly coordinated and integrated centers in as many countries, employing approximately 800 specialists.

**Product Management Division**

The experience acquired over these last few years has brought about positive results in coping with critical situations systematically through strategies or management plans, or even ad hoc where necessary. This has emphasized the need to establish a single product management division with product and marketing functions. Activities will primarily focus on demand analysis, product development and industrialization, and manufacturing efficiency.

### European Management Division

The division is the most significant innovation in the new structure, and is designed to be the first step toward meeting the European [single] market deadline in due time and in the right way. The reorganization that the European cable industry is currently undergoing in view of 1993 will undoubtedly bring about operational changes. It is therefore necessary to be prepared for this event.

Overall, the new structure will strengthen the resources of each division in the cables sector. However, it also reconfirms the effectiveness of the policy pursued so far, where subsidiaries, which are suitably equipped to handle their own business, are managed by a "streamlined" center. This is the overall picture of the strategy pursued by Pirelli Cables S.p.A. Its goal is to consolidate a large-scale manufacturing base at an international level, and to offer a complete range of products and services that are constantly updated thanks to research and technological innovation.

### Pirelli Cables

The Pirelli Cables Sector holds a leading position worldwide, with 20,000 employees, 70 plants in 12 countries—Europe, North and South America, Africa, and Australia—and a production capacity of more than 650,000 tonnes a year.

Its competitive levers include internationalization, which began in 1902 with the installation of manufacturing plants in Spain, research (in Brazil, France, UK, Italy, and the United States), and technological innovation.

The following are the main areas of activity of the cables sector.

**Energy Transmission and Distribution:** Electrical cables—from low to very high voltages, for ground, submarine, and air applications—accompanied by a wide range of accessories.

The goal is to increase the power carried over long distances for extremely high voltages. Pirelli has developed high-voltage cables for underwater connections at up to 2,000 meters in depth.

**Telecommunications:** Pirelli manufactures local and long-distance cables, and standard and optical fiber cables. Particularly innovative on the market is the cable permitting high traffic density transmission over long distances with fewer repeaters, both via sea and land. Other important areas of development are in the field of amplifiers and optical sensors, as well as integrated data transmission networks [LAN's [local area networks]].

**Special Cables:** These cables are used under critical operating conditions (fires, nuclear radiations, chemical attacks) as well as in conditions where reduced fume and toxic gas emissions are imperative. Low-voltage cables and cable accessories for industry, the building industry, and

other specific applications as well as enameled wire coils for electromechanical applications complete the range.

## EAST-WEST RELATIONS

### EC Approves Aid Projects for East Europe

#### PHARE Program

91AN0227A Brussels *EUROPE in English*  
25 Jan 91 p 8

[Article: "EEC/Eastern Europe: "The Commission Finances Two Programmes To Assist Hungary, Poland, Czechoslovakia, Romania, Bulgaria, and Yugoslavia in Creating Joint Ventures and Solving Technical Problems"]

[Text] Brussels, 24 January 1991 (Agence Europe)—The European Commission has decided in the context of the PHARE programme of support for the reform process in Central and Eastern Europe to finance two programmes to the amount of 25 million European currency units [ECU], in order to contribute to the adjustment of the economies of the beneficiary countries and to increase cooperation between their companies and those in Western Europe. These programmes consequently exceed the financing of specific projects and are targeted at the very structures of the economy. The countries concerned are the six PHARE beneficiary countries, including Romania for the first time, i.e.: Hungary, Poland, Czechoslovakia, Romania, Bulgaria, and Yugoslavia.

The following are the objectives and content of the two programmes.

1. A mechanism to support private sector initiatives aimed at the creation of joint ventures (ECU200,000). This mechanism is intended to incite and aid Community companies in the creation and development of joint ventures with a local partner in Central and Eastern Europe. It is expected to contribute to increasing the flow of foreign investment, which is currently insufficient but extremely important for the relaunch of economic growth and development through private sector initiatives. This support mechanism is targeted at small and medium-sized enterprises (SMEs), without specific sector-based preference. It is complementary to the SME programmes already approved for Poland and Hungary, which are more particularly aimed at credit services and commercial assistance.

The mechanism includes four sections intended to cover the entire investment process, from prospecting for possibilities to the extension and reinforcement of existing joint ventures. The mechanism is intended to:

- Stimulate actions that generally encourage greater participation by SMEs in the Community in the creation of private enterprises with partners in Central and Eastern Europe;
- Contribute to steps being taken prior to the creation of a joint venture per se, by cofinancing feasibility

studies and launching credits needed for the initial stages of an investment (pilot projects, for example);

- Allow the capital needs of the joint ventures that are created, restructured, or extended to be met;
- Strengthen resources in the area of human resources and the transfer of know-how by participating in training and other forms of technical or management assistance.

Given the need to ensure greater intervention by the financial sector and to effectively associate all the Member States, the mechanism will be implemented and managed in close cooperation with a network of financial institutions which will serve as intermediaries and coinvestors.

2. A multidisciplinary technical assistance programme (ECU5 million). This funding will finance activities in the area of technical cooperation, training, and promotion in the area of trade and investment, with the following objectives:

- To guarantee swift and effective use of the aid by acting in the area of preparation and implementation of the PHARE programme in general, and each project in particular;
- To respond speedily and flexibly to the urgent needs of the beneficiary countries as regards limited activities in the area of training, promotion of trade and investment and to increase trade and economic relations with the Community;
- To improve the Commission's capacity to effectively and swiftly deal with the urgent problems arising in the beneficiary countries and to effectively organise its aid.

### TEMPUS Program

91AN0227B Brussels EUROPE in English  
31 Jan 91 p 7

[Article: "EEC/East European Countries: ECU25 million From the TEMPUS Programme (Trans-European Mobility Scheme for University Students) From the 1991 Budget"]

[Text] Brussels, 30 January 1991 (Agence Europe)—The European Commission released ECU25 million last December for the TEMPUS programme, which is intended to encourage the cooperation between EEC university institutions and East European countries. In order to be eligible, the projects must involve at least two Member States and one Polish, Hungarian, Czechoslovakian, or East German institution. In total, 153 projects were retained, that is 11 percent of the projects submitted. The programme is divided into three:

- The joint projects (which represent alone ECU16.5 million): student exchanges, creation of new courses, teacher exchanges, material, investment;

— Mobility correctly speaking, either within joint projects, or "free";

- Complementary actions (ECU1 million) such as the publication or translation of scientific works, the participation in European university associations, or the creation of new associations, etc.

Finally, ECU1.8 million out of ECU25 million are intended for the management of TEMPUS.

55.6 percent of the projects involve Poland, 41.2 percent Hungary (the two countries for which TEMPUS had been created in the beginning in the proportion 2/3-1/3), 25.5 percent Czechoslovakia, and 7.8 percent former GDR. Certain projects involved several countries at the same time. The 25 million represent the fourth tranche of the TEMPUS programme for 1990, which is an exploit to the extent that TEMPUS was created on 7 May 1990. In July, 2 million were devoted to launching costs; ECU1 million was then released in September for the launching of the programme in the GDR; and then 4 million more in October for Czechoslovakia's participation. For 1991, one participant country, the GDR, disappears; in return, Bulgaria and Yugoslavia will take part in the programme. The deadline for submitting demands is fixed at 15 March 1990.

The TEMPUS programme is to be situated in the framework of the PHARE action next to the establishment of the European Foundation for Training. Community financing in these two projects should be by way of ECU300 million over a period of three years (1990-1992).

### France, USSR Sign Scientific Cooperation Agreement

91WS0218B Paris AFP SCIENCES in French  
14 Feb 91 p 3

[Unattributed article: "Signing of French-Soviet Agreement on Scientific Policy"]

[Text] Paris—The Ministry of Research and Technology has just signed with its Soviet counterpart, the State Committee for Science and Technology, a draft cooperation agreement, effective for a period of five years and renewable, which should permit the USSR to become acquainted with French methods of definition, management, and evaluation of scientific policy.

This agreement was signed at the end of the week-long visit—from 3 to 8 February—of Mr. Nikolai Laverov, member of the Academy of Sciences of the USSR, Minister of Education, and one of the four Soviet Deputy Premiers.

A spokesman for the Ministry of Research stressed that the agreement was signed at the request of the Soviets. "They have asked for a high level dialogue for assistance in the design of their scientific policy, in comparison with the policies followed elsewhere. They made the same approach to the Federal Republic of Germany and

the United States, but they have told us that they felt closer to our methods," pointed out a technical adviser to Mr. Hubert Curien.

Implementation of this agreement shall be swift and marked already this year by meetings in April in Moscow and in Paris, in particular a symposium on marketable Soviet techniques. Work will also be carried out on a program to welcome high level "post doctoral" researchers to France and on an industrial policy project. The Soviets also indicated a very strong desire to have access to French scientific and technical databanks.

Among the general cooperative themes, Mr. Laverov cited research on the international program Global Change, the environment, and nuclear reactor safety, insisting on the necessity for all countries using nuclear power to avoid another Chernobyl. The Soviets also expressed their desire to participate in large medical research projects, in particular on the human genome. According to a spokesman at the Ministry, Mr. Laverov also wanted to see space cooperation continue and said that this cooperation could be extended to include earth observation.

During his visit, Mr. Laverov conferred with members of the Academy of Sciences, leaders of the National Center for Scientific Research (CNRS), the National Agency for the Upgrading of Scientific Research (ANVAR), the Atomic Energy Commission (CEA), the National Agency for the Management of Radioactive Wastes (ANDRA), whose Soulaïnes storage center he visited (near Troyes), the Rhone Poulenc group, and La Villette City of Science and Industry.

He also met with Mr. Le Deaut, president of the Parliamentary Office of Evaluation of Scientific and Technological Risks, an agency which he seemed to feel should serve as a model for the creation of a similar body within the parliament of his country.

### **Germany, Czechoslovakia Agree to 30 R&D Projects**

*91WS0160A Duesseldorf VDI NACHRICHTEN  
in German 18 Jan 91 p 8*

[Article by Christian Patermann: "With Giant Steps Back to Europe"]

[Text] On their way to a new political order, the central and eastern European states are setting their hopes to the FRG. What is involved in this connection is not actual economic aid. The former East bloc nations want to prepare for the markets of the future with close scientific cooperation.

It is well known that the old and new Laender of Saxony was previously a pronounced "high-tech region," with automobile industry, aeronautics and chemical industry. But the fact that neighboring Czechoslovakia also enjoyed an excellent reputation for technology is something fewer people know: Even after the war, Vitkovizer Steel, the Skoda-Plzen machine-building factory, had a

world reputation, and the fact that in the automobile industry Skoda is today being wooed by world-famous European auto companies is surely not by chance.

This something to remember now that there is talk about a new era of German-Czech relations in research and technology: On 2 November 1990, the German Research Minister, Dr. Heinz Riesenhuber, together with his Czech colleague, Dr. Pavel Hofmann, minister for strategic planning, signed the first scientific-technical cooperation agreement after the reunification with a central and eastern European nation that still belongs to the CEMA [Council for Mutual Economic Assistance]; moreover, it is the first agreement which no longer needs a Berlin clause.

This agreement, signed on 2 November 1990, closed the last missing link in the chain of cooperation partners of central and eastern Europe in the former East bloc region. After an extensive agreement on science and technology was signed in 1986 with the USSR, scientific and technological cooperation between the FRG and the nations of central and eastern Europe was systematically expanded. An agreement was reached with Hungary in 1987, with Bulgaria in 1988, and with Poland in 1989. Similar government agreements had already been concluded with Romania and Yugoslavia in the 1970's, more precisely in 1973 and 1975.

The goal of the agreement between the government of the FRG and the government of the Czech and Slovak Federative Republic, according to the exact wording of the text, is to promote cooperation in science and technology on the basis of equality, reciprocity, and mutual benefit (Article 1). This is to take place, according to Article 2 of the agreement, in the form of exchange of scientific and technical information and publications, organization of scientific and technical events, the exchange of delegations, scientists and other expert personnel, joint use of scientific and technological facilities or installations, as well as by planning and carrying out joint projects in the areas of scientific research and technological development.

The spectrum of this first coordinated program—it involves 30 concrete projects—ranges all the way from materials research and reactor safety research, agriculture, chemistry, coal research, social sciences and medical research to the geosciences. In the energy sector special importance will be placed on safety research for light-water reactors. Partners on the German side in this field is the Association for Reactor Safety in Cologne and the Federal Institute for Materials Research, which in two special projects will undertake probability analyses as well as projects in fracture mechanics and stability. On the Czech side the partner is the Institute for Nuclear Research. In this field the German side offered to include the Czech side in the ongoing reactor safety research between the USSR and the former GDR which was started in April 1989 and includes for example questions of reliability and risk analysis for the Saporoshe WWER 1000 and the Biblis B

nuclear power plants, as well as the use of special framework programs to analyze breakdowns caused by coolants. Biological research also occupies a relatively large space even in this first round of cooperation: Cooperation in studying field and weed vegetation (Federal Biological Institute for Agriculture and Forestry—BBA—in Braunschweig on the German side, the Agricultural College in Prague on the Czech side), dealing with problems of animal husbandry, biotechnology in animal production with special consideration for conservation and utilization of genetic resources and evaluation and maintenance of forest resources, are areas in which the Federal Research Institute for Agriculture in Braunschweig-Voelkenrode as well as the Federal Research Institute for Forestry and Timber Industry in Grosshausdorf near Hamburg and the corresponding Czech research institutes intend to cooperate.

An initial project to study the acid rain with respect to changes in the condition of the soil chemistry and to the quality of seepage water, as well as the effects of fertilizers and plant pesticides by Munich University and the Research Institute for Plant Production in Drnovska shows where one extremely important focus of cooperation will be in the future: Both ministers made it clear in their talks that energy and environmental issues, particularly those involving forest damage research, health research and, at the request of the Czech side, information technology as well, will clearly represent additional points of emphasis for future cooperation. On the other hand, proven relations between scientists have already existed for some time in the area of the geosciences. Scientists and geologists have long cooperated on the project of continental deep drilling at Windisch-Eschenbach, where the principal drilling at the western edge of the so-called Bohemian massif was recently begun with the participation of the Czech Research Ministry.

On the occasion of the signing the two ministers also discussed a series of other, in part very fundamental, problems of joint cooperation, which also have an impact on cooperation with the other abovementioned central and eastern European states in the former East bloc. The former GDR had enjoyed close relations precisely within the framework of CEMA in space flight, in connection with Interkosmos and Intersputnik. One must now jointly determine which of these agreements, which projects from this previous understanding, are now worth continuing.

Furthermore, Research Minister Riesenhuber suggested to his Czech counterpart that the research ministers or other responsible colleagues from the former East bloc nations, who at present are carrying out a thorough reorientation of their scientific and research structures and their contents, including with regard to the modernization of their economies, should meet in a few months in Germany for an informal exchange of opinions. It is evident from studying the former relations of the GDR with these nations, from Germany's special geographic location and the traditional close ties with central and eastern Europe in the past that Germany, above all, has a major responsibility in this

respect. This proposal was received positively by the Czech side and it will, for its part, help push for such a meeting when discussing the contents and formalities. We should particularly support the loud cry of "Back to Europe" heard precisely in Czechoslovakia.

In the talks between representatives of the well-known Czech universities and advanced schools, such as the Karl University in Prague, the Komensky University in Bratislava, with the president of the Federal Academy of Sciences and the increasingly influential provincial ministers, that is to say the Czech and Slovak ministers for economic development, one thing became very clear, however: In addition to the chronic lack of modern research equipment, there is danger of a vacuum being created, a vacuum of structures, of research content, of scientific goals, unless help is quickly provided by the West. After the July 1990 elections, the State Commission for Scientific and Technological Development and Investment, until now responsible for research policy, was dissolved. The Ministry for Strategic Planning is now responsible for science and research, and for technological development it is the Ministry of Economics. Independent financing and organizational structures are to be created. This will also have an impact on the federal Academy of Sciences. It became clear in the talks that the Czech side expects help to be given, not in the sense of a patronizing, sponsoring "superimposition" of our system, but in the sense of guidance: The newly organizing joint commission will, therefore, soon prepare a joint seminar on research policy, at which the basic features of our scientific and research system, which simultaneously includes the federal level, are to be presented to our partners. In this connection the agreed-on cooperation on the subject of "prerequisites, conditions and consequences of scientific activity in the post-industrial society" will also be given major significance.

The strengths of Czech research and science lie in the fields of the geosciences, astronomy, astrophysics, crystallography, solid state physics, ceramic materials, in applied computer processing, cybernetics, chemistry, and life sciences. It should be pointed out that an agreement for further development of scientific and technological cooperation between CERN [European Nuclear Research Center] in Geneva and the Czech Academy of Sciences was already signed in March 1990. Now the task will be to expand these strengths with the help of cooperative projects.

### **Rhone-Poulenc Opens Prague, Bucharest Offices**

91WS0189B Paris *LE MONDE* in French  
13 Feb 91 p 26

[Unattributed article: "Rhone-Poulenc Opens Two New Offices in the East"]

[Text] The Rhone-Poulenc group, France's top chemical and pharmaceutical company, has just opened two new offices in eastern Europe, one in Prague (Czechoslovakia) and the other in Bucharest (Romania). The teams sent, made up of 15 and six people respectively, were

given the task of identifying customers and seeking collaborative agreements with local companies undergoing privatization. The establishment of these offices indicates Rhone-Poulenc's desire to shore up its operations in the eastern part of Europe, where the group already holds significant market positions in chemicals and agro-chemicals.

### **Romania To Expand Telephone System**

*91AN0176 Brussels EUROPE in English*  
12 Dec 90 p 18

[Text] The German group Siemens has entered into partnership with the Romanian Postal and Telecommunications Office and with the Romanian company Electromagnetica for the annual establishment of 500,000 lines before 1992. The new company, Emcom, will be held at 49 percent by Siemens and the two Romanian companies will hold the remaining 51 percent. This represents an initial investment of 20 million German marks for Siemens, which will thus play a key role in updating the Romanian telecommunications network (which will be digitized in time).

### **Siemens Establishes Telecommunications Joint Venture in Romania**

*91WS0251B Bucharest TRIBUNA ECONOMICA in Romanian* 11 Jan 91 p 5

[Article by V. N.: "Telecommunications During the Reconstruction"]

[Text] The end of 1990 saw an absolute first in our country's telecommunications: the inauguration of an international digital telephone exchange. The contract to install the modern EWSD digital system at this exchange, a system which is currently installed or being installed in 46 countries to include more than 22 million telephone lines, was signed in March by the Romanian Post Office and the Siemens company. This first digital telephone exchange in Romania has a capacity of 3000 lines, marking the practical beginning of the digitization of Romania's telecommunications network.

The Siemens company delivered and installed the whole system as the first stage of its collaboration with Rom Post Telecom. The system noticeably improves the quality of international conversations to and from Romania, representing at the same time a significant contribution to the development of a modern, high capacity telecommunication network in Romania.

The initiation of the new international telephone exchange, however, is but a first step in a larger cooperation between Siemens and its Romanian partners. Electromagnetica, the largest producer of telecommunication equipment in Romania, together with the commercial firm Rom Post Telecom, have thus closed a contract to form a joint company with Siemens on 7 December 1990.

The contract sets the foundation for starting the manufacture of the modern telecommunication system EWSD, as well as other modern transmission installations. The plan provides for 100,000 lines during the first year, for 250,000 during the second, and for 500,000 during the third year.

The EWSD digital telecommunication system that can operate in local small or large exchanges, as well as in transit exchanges, is already in place in Romania, at the Bucharest digital telephone exchange.

The investment of 20 million marks required by the joint company during its first stage, will increase by about 15 million marks during the next two production years.

Siemens contributes 49 percent to the joint company EMCOM, with 51 percent being provided by the Romanian partners. Manufacturing, distribution, and technical support activities will create more than 800 jobs in EMCOM. Siemens will support the future deliveries and investments needed by the joint company through advantageous credit.

### **Ericsson, Siemens Assist Hungarian Telecommunications Modernization**

*91WS0198B Budapest COMPUTERWORLD/SZAMITASTECHNIKA in Hungarian* 10 Jan 91 p 1

[Article by Peter Sz.-Szalay: "Ericsson Is First, Siemens Is Second"]

[Text] A result has been announced in a competition which has aroused the greatest interest in recent years. The Swedish Ericsson Telecom AB and the German Siemens AG have won the tender of the Hungarian Telecommunications Enterprise.

The competition, announced as part of the long-range telecommunications development program and serving selection of a digital switching technology system, was announced in September of last year with the cooperation of three ministries—Transportation, Communications, and Water Management, Industry and Trade, and the Ministry of International Economic Contacts. And although it was not one of the written conditions, the competitors did have previous agreements with their future Hungarian partners with whom, if they won, they would cooperate and to whom they would transfer manufacturing and operating technology. Even before the deadline on 23 November, it was generally known that Ericsson wanted to realize the program with Muszertechnika [Instrument Technology Cooperative], that Siemens wanted to do so with the Telephone Factory, that the North American Northern Telecom wanted to do so with the BHG [Beloianisz Telecommunications Factory], that the French SEL-Alcatel wanted to do so with Videoton, and that the Italian Italtel wanted to do so with the Precision Engineering Enterprise.

Well, the competition was especially exciting for this reason, as participation in the development program

would, at least in part, have guaranteed the survival of the last three domestic large enterprises. According to the estimates the manufacture and operation of digital telephone exchanges will give work to about 500 or 600 people. It may be no accident that the two firms with the most experience in Hungary and the most local knowledge chose the prospering Muszertechnika and the Telephone Factory, struggling with fewer problems than the last three, as their future partners.

The tender, handled by the Transelektro Trading Company, was concluded with the World Bank methods known around the world and accepted here also. Computers evaluated the answers given to the several thousand questions, arrayed in 340 main groups, with the cooperation of about 100 experts. The computers and the experts unambiguously found the offers of Ericsson and Siemens to be the best, recognizing that the others also submitted high level programs.

The framework contracts were signed within hours of the announcement of the results. According to these contracts the victors are obliged to hand over 57,000 lines in the first year of the program, in 1991. For a start Ericsson is undertaking nearly a double part of this. In years to come the ratio may turn around because there will be a price competition every year for 30 percent of the investment. An essential condition of the contracts is that even in the first year the Hungarian partners will do one third of the manufacture, and this ratio will increase from year to year, to a significant degree. The contracts also provide that in the years ahead the Hungarian enterprises will have access to the latest developmental achievements and that they will also have possibilities for export.

The greatest winners of the competition will be those in Hungary who need telephones, and those who already have telephone lines too because when the new exchanges are put into operation they will get special services incomparable with present ones. First of all, even this year, the inner city of Budapest will get a digital telephone exchange. In 1992 similar exchanges will be installed in every county capital, according to the program, within the framework of which the domestic telephone network will be expanded by 600,000 lines by the end of 1993—including a hundred thousand from switching centers manufactured by the BHG.

And how much will all this cost? In 1989, they calculated 360 billion forints for the 10 year telecommunications development plan. For the first three years they calculated 110 billion plus 60 billion from other sources. Will this money be enough with the present and expected inflation? Obviously not. The world market average for installing one line is now 200 dollars. The Telecommunications Enterprise got a price lower than this, and this may be forced down further by the yearly price competitions. And what is most important, it can pay virtually 100 percent in forints!

### **Ericsson To Supply Telecommunications Equipment to Hungary**

91AN0228 Chichester *INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE*  
in English 14 Jan 91 p 4

[Unattributed article: "Ericsson Grabs Major Supplier Status"]

[Text] Ericsson says it has been named "first supplier" of equipment for Hungary's public telecommunications network over the next five years, supplying the majority of the 1.5 million new telephone lines planned for installation during that period.

The company claims it was selected following bidding by some of the world's largest telecommunications suppliers and that this agreement is among the first of the large telecommunications purchases expected in eastern and central Europe within the next few years.

This announcement was also accompanied by news of additional business in Hungary. Ericsson has received a separate contract, worth approximately 55 million Swedish kroner, to quadruple the capacity of the international AXE gateway exchange which it installed in Budapest in the Spring of 1989. The company is also negotiating an order to extend the cellular mobile telephone system that was installed in Hungary just over two months ago. Demand for the cellular service—operated by WesTel Radiotelefon, a company in which U.S. West is a major shareholder—has been very popular and the system has initially served 2,000 subscribers. The number of subscribers is expected to reach 20,000 by the end of this year.

Ericsson won a breakthrough order only two months ago to supply AXE and transmission equipment for the country's rural telecommunications network.

## SCIENCE & TECHNOLOGY POLICY

### Romania's Science and Technology Status Analyzed

91WS0251A Bucharest TRIBUNA ECONOMICA  
in Romanian 26 Oct 90 p 14

[Article by Dr. Ileana Ionescu-Sisesti: "Centralization and Decentralization in Science and Technology"]

[Text] The fact that we are now in a period of transition from a centralized economy to a market economy has already become part of the public's awareness, and has become a sort of "trademark" of the distressing times in which we live. The question is whether this is not also creating the risk of uncertainty. Can the field of science and technology accept such a strategy?

A quick analysis indicates that applied science, aimed at technology and industry, must obviously reflect the pulse of the market since it is financed by its direct beneficiaries. However, fundamental and advanced science cannot generally be of immediate and risk-free interest for the profit-oriented investor. An economic enterprise needs a great deal of experience on the market and great economic strength before it can allow itself to engage into projects that involve a certain amount of risk. This is certainly not the case of the market competition "fledglings," such as Romania's economic organizations in the near future.

At the same time, a country cannot afford to suffer the loss of science fields that sometimes can appear as "art for art's sake." Applied science cannot progress unless fundamental science advances step by step and at its own pace. The disregard of human resource and management sciences creates a serious handicap at present, given the absence of "key" solutions that are so badly needed now.

Some areas of general interest, such as ecology, do exist. The latter affects all organizations, persons, and concerns, but its problems are too complex to be solved with individual local initiatives.

All of which points out that there are times in science when there is a need for support from centralized institutions, or from the state in the form of financing or coordination. However, this form of centralized intervention must not be confused with an encroachment on organizational autonomy and on the self-determination of scientific development.

The conclusion to be drawn is that the centralization/decentralization ratio in science and technology must be considered an optimization problem as a function of specific internal and external factors in the field. Decentralization at any price, privatization, indiscriminate use of market laws, can be harmful in these cases.

What is more, at a macroeconomic level, science requires considerable resources and produces equally

considerable effects. This makes it necessary to formulate science (and technology) policy as a structure of stimuli, measures, and action principles oriented toward the country's socioeconomic development. Science's double role is to be an intrinsic part of culture, as well as a means to develop other areas of society.

Focusing the analysis on the situation in Romania's current transition period, we note that the question of fundamental and advanced research was solved by redefining the structure of the state-supported research institutes in the Romanian Academy. The problem of financing fundamental research outside Academy institutes has not yet been solved. Moreover, the weak endowment of institutes regained by the Academy will continue to be inadequate for this type of research in the upcoming period.

Applied research however, finds itself in a dramatic situation. Industry is currently not interested in the results of scientific research. Since they do not yet operate on competitive grounds, on the "develop or die" principle, enterprises have no interest in the output of scientific research and technical development. Many research and design institutes are currently threatened with extinction due to a lack of orders. But science and technology is a continuum that cannot withstand missing segments. If in the future, a period of growth will renew the need for the services offered by these institutes, it will probably be too late, because the accumulated experience and initiative of these knowledge-production organizations will have been lost. (This does not mean that we are pleading to preserve the current situation of huge institutes that produce few and not very useful results; we are simply pointing out the danger of the other extreme and registering the need for judicious solutions).

Another point that deserves consideration is the danger of foreign scientific research and technical development competing on the domestic market with our national research. In the absence of legislation to protect it, Romanian research could predictably be stifled by foreign companies well adapted to competitive conditions.

And lastly, the ecologic problems are enormous, without any organizations available to undertake a frontal and effective attack against them.

This brief review of the situation indicates that during the current transition period, a substantial support from the state needs to be allocated and/or maintained if science and technology are to become the desired "leverage" for developing society as a whole.

The problem is further complicated by the corruption of science and technology's natural development process during the totalitarian era; the healing of these matters will take time. Some of the difficult incidents of the past that have left strong imprints are the encouragement of false values together with the introduction of values that have no merit, the direct consequence of which is the shortage of properly qualified research staffs; an inferior educational system; the transformation of science into



ideology; the metamorphosis of indisputable and mutually motivating relationships between science, education, and the economy, into the familiar rigid formula that stifles all initiative; a belated optimistic view, leading to the neglect of negative effects that have accumulated in a downright dangerous manner through the years; isolation from universal values; an unfounded scientific policy; and so on.

These problems are generally present in all Eastern European countries, each reflecting its own sociocultural contexts. All of them affect the development of science and technology, and seriously complicate the healing process.

A number of conclusions can be drawn from the above. In the transition to a market economy, science and technology must be considered in a framework appropriate for the field and for its complex interactions with the rest of society; in this case, adaptations to the law of supply and demand could be damaging.

What is more, the transition period requires a special effort to find the ways and means that will enable an effective transition to the new condition, so that parts of the field of science and technology will not die out, a danger that is being perceived at present.

Effective financing mechanisms, as well as the formulation of a fundamental science policy from specialized studies, are necessary. This will be aimed at establishing general orientations and priorities as a function of national and international considerations, at identifying and supporting leading areas of interest, at correlations with other areas of socioeconomic life, and so on.

One particularly timely area, therefore, is that of "science policy studies" and the training of specialists for it. Considering the fact that Eastern European countries are confronted with similar problems, cooperation in solving them could be extremely useful.

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