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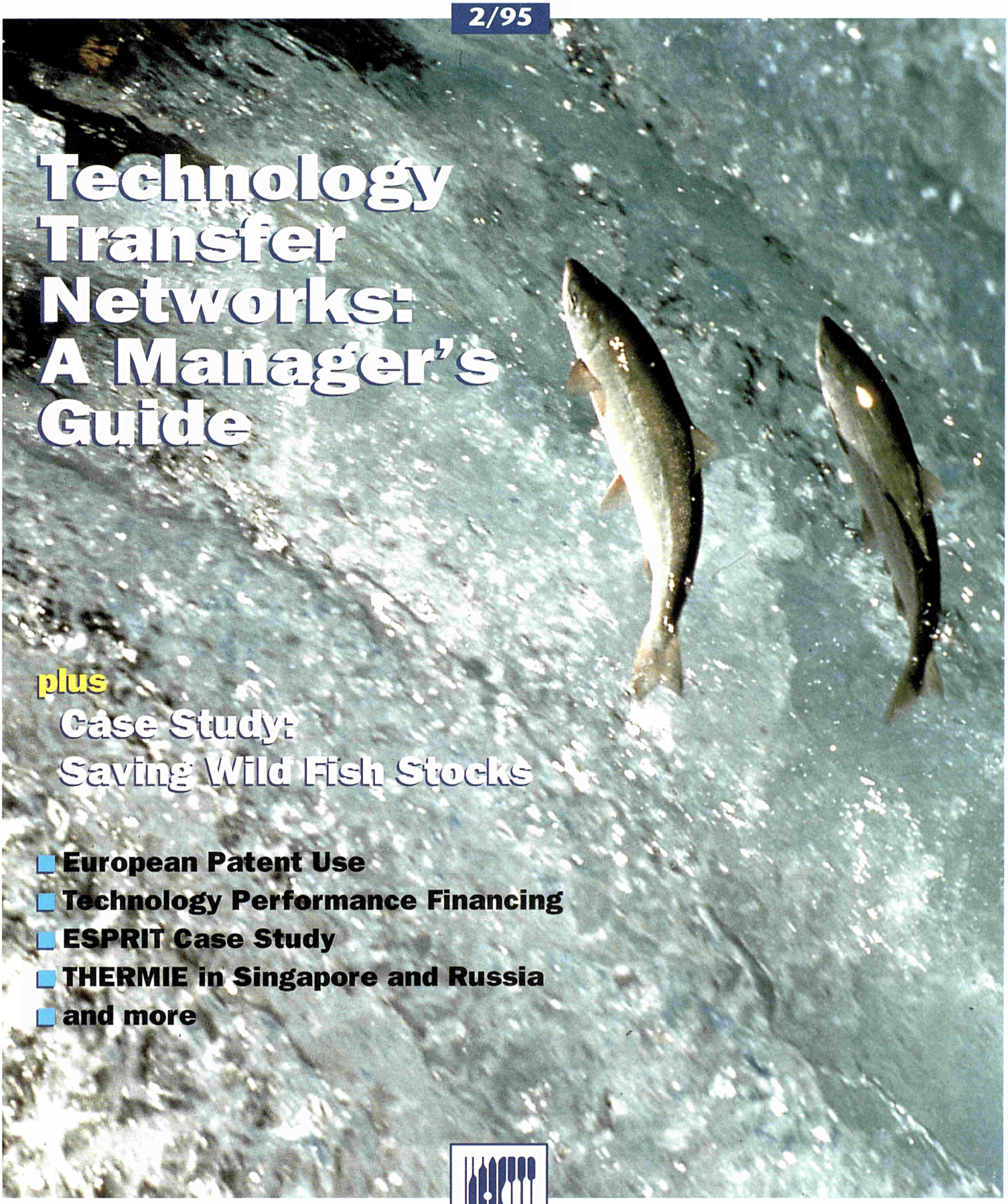

Technology Transfer Networks: A Manager's Guide

plus

Case Study: Saving Wild Fish Stocks

- European Patent Use
- Technology Performance Financing
- ESPRIT Case Study
- THERMIE in Singapore and Russia
- and more

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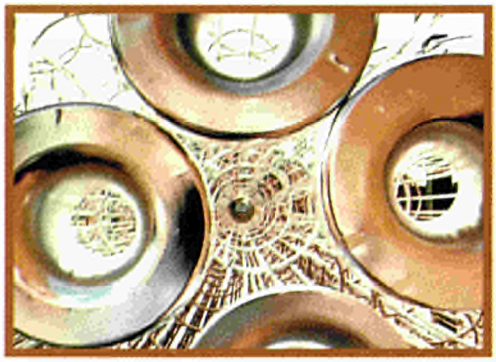

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Patents, Projects and Networks

Studies, Calls for Proposals and Best Practice

What can be read from trends in patent *applications? This issue of Innovation & Technology Transfer kicks off with a report of a wide-ranging study by the European Patent Office (opposite page). The study has much to say about the different approaches to patenting according to company size, nationality and so on.*

The new EC Programme for the dissemination and optim*isation of research results (the 'Third Activity'), summarised in the last issue, is well under way. A Call for Proposals has already been launched for a network of relay centres to build on the experience of the existing pilot network. As this issue goes to press, a wide-ranging Call for Proposals for both technology transfer and technology validation projects is at an advanced stage of preparation (see page 7). Short definition phases for selected projects will begin later this year.*

The Dossier examines transnational technology transfer *networking in depth. Ten years' worth of experience has recently been distilled into publications and training services presenting the 'best practices' in managing these networks. The Dossier summarises the main lessons and shows what can be achieved through two case studies - practical examples of how networks have made the transfer of technologies possible between countries and industries.*

Another case study, this time on the work of the Third *Activity (see pages 8-9), reports on a fascinating collaboration, helped by a relay centre, between Danish and Scottish firms and research institutes. Their technology combines sound and electric fields to dissuade fish from entering the water inlets of power plants. Trials are planned to test the system in Scotland's annual salmon migration. The technique could conceivably have surprising applications further afield.*

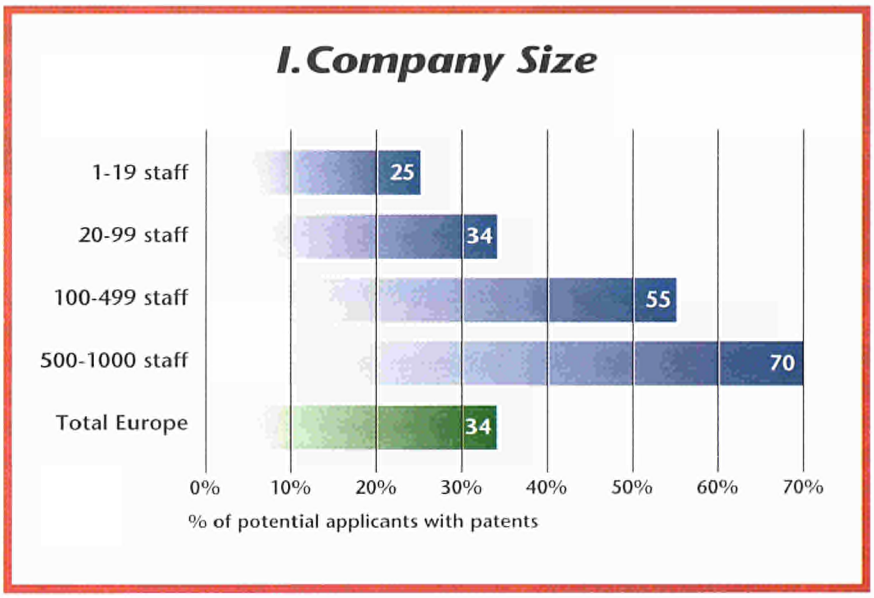
This issue ends with reports of an ESPRIT Case Study and *news from the research, development and demonstration Programmes, including the THERMIE Programme's work in helping European companies in the energy sector reach markets from south-east Asia to the steppes of Siberia.* ■

► INTELLECTUAL PROPERTY

European Patents: Untapped Potential

A recent study by the European Patent Office (EPO) sheds light on why patent applications from European companies have stagnated while applications from the US and Japan have climbed.

The European patents granted by the EPO since 1980 can provide patent protection in any or all of the European Patent Organisation's 17 member states(1), depending on the applicant's needs.



The larger the company, the more likely it is to apply for patents.

The formula has proved very successful, with a sharp rise of applications during the 1980s.

Since 1992, however, the annual total has remained constant, while the proportion of European applicants has declined from 54% to 48% during the 1980s. American and Japanese companies seem to appreciate the European patent more than those for whom it was invented. Reversing this decline will require new strategies, but new strategies require new data.

'Utilisation of Patent Protection in Europe'(2), a study carried out last year, provides data on the use by (mainly small) European firms of both the national and European patent systems. One hundred applicants from both the USA and Japan were also interviewed for comparative purposes.

The main phase was a representative survey, carried out on a quantitative basis, involving almost 9,000 screening interviews followed by 2,350 in-depth interviews. The study provides information on:

- innovation and patent activity by country, company size and industrial sector;
- attitudes to innovation and patent activity;
- why non-applicants do not use patents;
- factors and conditions favourable to the use of patents;
- the importance of patent protection as a competitive tool;
- awareness of the patent system.

European Patents: A Steady Decline

In 1992 Japan produced 2,665 patent applications for every million inhabitants. The equivalent figures are 388 for the USA and 245 for Europe. Despite this, European industry is still relatively well protected by patents. However, this applies chiefly to traditional technologies with stagnating markets.

The recent levelling of European patent applications is no doubt due in part to the recent economic recession. Nevertheless US and Japanese companies, although hit by the same recession, continue to file more patent applications. With all industries - particularly hi-tech sectors - becoming more global, this is a worrying trend for European competitiveness.

The study restricted itself to Europe's 1.8 million production industry companies. Removing small handicraft businesses and companies without R&D reduced the number of 'potential applicants' - companies that could benefit from the patent system - to 170,000 companies.

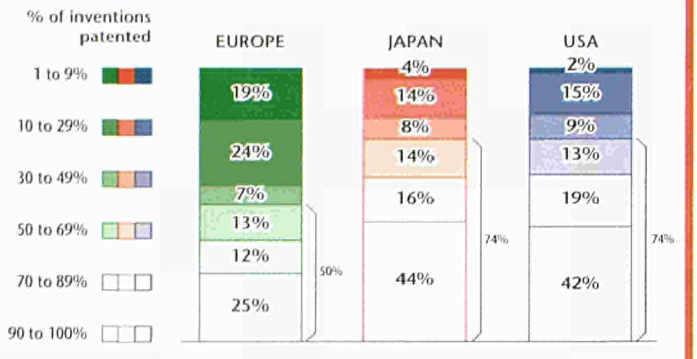
One third of these companies are 'applicants' - they have already made use of the patent system. Thus the vast majority (65%) of companies that could use patents do not. This basic ratio is found right across all 17 EPO member states, even though most applicants (74%) are in France, Germany, Italy and the UK.

The study also broke the various companies down into 8 sectors, finding that manufacturers of metal products patent the most often, with 40% of potential appli-

(1) The EU 15, with the exception of Finland (expected to join this year) and the addition of Switzerland, Liechtenstein and Monaco. Extension agreements exist with Slovenia, Latvia and Lithuania. An extension agreement with Romania is expected to enter into force this year.

(2) EPOscript 3, ISSN 1021-9390, 79DM. Send a fax to Mrs Emer (Fax: +43 1 521 26 24 91), specifying language (English, French or German).

II. International Comparisons



European companies are far more reticent about filing applications for patentable inventions than in Japan or the USA.

cants filing patents. This figure falls below 30% in two sectors:

- chemical/pharmaceutical;
- precision mechanics and optics.

SMEs: A Sceptical Audience

The study finds that SMEs are especially sceptical about patent protection for the following reasons:

- the cost of patents is often considered as a risky and unprofitable investment;
- patents do not guarantee commercial exploitation;
- the annual 'patent maintenance' outlay does not necessarily deter imitators;
- many SMEs prefer to rely on their know-how and aggressive marketing, or dispense with innovation altogether.

In fact, only 25% of potential applicants with less than 20 employees have filed patents. The figure climbs as the companies increase in size (see Graph I, page 3), showing that the SME sector could become, with the right policies, a major source of European patents.

The study also found that, on average, only 9% of the potential applicant small companies in Denmark, Greece, Portugal and Spain apply for patents. The opposite end of the spectrum is found in the Netherlands (39%), Austria (33%), Ireland (31%) and Belgium (30%).

SMEs that do use patents, however, commercialise the invention more often than big companies, which in some cases file the application simply to better control the relevant market. The large companies also see licensing patents as more important than SMEs - the larger the company, the more often it acquires and trades licenses.

One Strategy of Many

When the researchers asked the companies what tactics they used to protect their new products and processes, the response was a mixture of patent protection and secrecy - two strategies which are often at odds.

For example, almost all (84%) of European companies which have used patents see them as their main weapon in protecting their new products, with secrecy coming second at 48%. This gap is lower when it comes to protecting processes, reflecting the relative ease in keeping new processes secret. Getting to the market ahead of the competition is, unsurprisingly, important in both cases.

Bigger companies tend to attach greater importance to both patents and secrecy than SMEs. In fact, almost one third of large companies (500-1,000 employees) have a patent department. These companies also tend to make more use of other industrial property rights, protecting design, trademarks and copyright. Not one company with less than 100 employees, on the other hand, has a patent department, using patent agents instead.

Finally, even those companies which use patents consider them less important than a large number of other 'competitive tools', such as product quality, delivery capacity, customer orientation and price policy. The two thirds of companies which do not use patents, unsurprisingly, ranked patents as the least important factor.

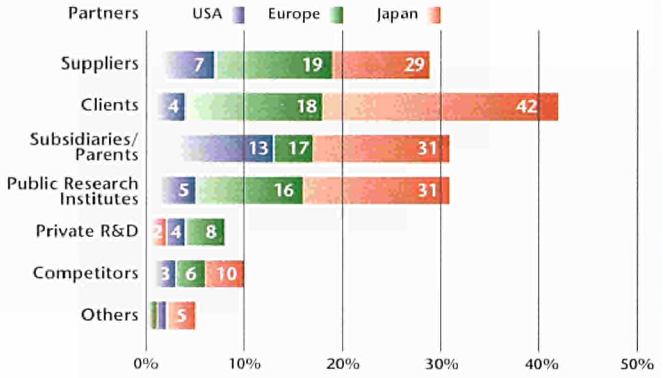
International Comparisons

As the study also covered 200 Japanese and American companies, it provides an interesting comparison of how technology-based companies in the Triad view patents and manage their R&D and commercialisation. Some findings include:

- **Europe Patents Less:** European companies patent a significantly smaller proportion of their inventions than their Japanese and American competitors. Only one quarter of all European companies patent 90-100% of their inventions, compared to over 40% of Japanese and American companies (see Graph II). However, European companies are more likely to have an in-house patent department.
- **Strategic Patents:** Japanese companies patent more often for strategic reasons than American or European companies.
- **In-House R&D:** Three quarters of US companies have their own R&D departments. The same is true for only half the European and a third of the Japanese companies. In Japan, just over half the companies prefer to control R&D directly from managerial level - the equivalent European figure is only 36%.
- **Outsourcing R&D:** Japanese companies outsource their R&D more than in Europe or the US. Both European and Japanese companies prefer to outsource to universities and research institutes, while American companies prefer private development companies.
- **Cooperative R&D:** Japanese companies tend to collaborate with their suppliers, clients, subsidiaries, parent companies and even competitors much more than American or European companies (see Graph III).
- **European Innovation:** Japanese companies improve their products/processes and launch new ones less often than European companies, who in turn fall into second place behind American companies.

The study shows that European industry makes less use of patent protection for its innovations than the US and Japanese companies, who have frequently integrated patent protection into the process of marketing their innovations.

III. Cooperative R&D



Japanese companies carry out significantly more collaborative R&D.

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EEA: Open for Business

The European Environment Agency opened its headquarters in Copenhagen last year.

In order to protect the environment effectively, policy makers need solid information on the emergence, extent and spread of ecological threats. The EC's CORINE (Coordinating Information on the Environment) Programme, launched in 1985, highlighted the unevenness of current data in terms of both coverage and quality, and began creating thematic data inventories on environmental parameters such as atmospheric pollution, land use, erosion risks and water resources. Significant achievements included recording and describing over 5,600 biotopes, producing a database quantifying three atmospheric pollutants and examining over 50% of the Community's land.

The European Environment Agency (EEA), officially created in 1990 but not 'headquartered' until early 1994 in Copenhagen, has inherited CORINE's databases, information systems and pool of experts.

Objective, Reliable Data

The EEA and the "European environment information and observation network", which it will coordinate, are intended to provide the Community and the Member States with objective, reliable and comparable information to enable them to take the measures necessary to protect the environment, as well as to be able to assess the results of these measures. It will also ensure that the public is properly informed about the state of the environment.

The EEA will provide the necessary scientific and technical support for all its activities, which will allow it to describe the present and foreseeable state of the environment in terms of quality, pressure and sensitivity.

Initial activities will focus on:

- Air quality and atmospheric emissions;
- Water quality, pollutants and water resources;
- The state of the soil, fauna, flora and biotopes;
- Land uses and natural resources;
- Waste management;
- Noise emissions;
- Chemical substances hazardous to the environment;
- Coastal protection.

Cooperation with international bodies such as the OECD and the UN Environment Programme will also be developed, as will the participation of Third Countries.

This year the EEA's staff will grow to around 50. The budget of 11 MECU, supplied by the EC, will support over 60 projects aiming to compile inventories of existing environmental databases and networks, share information and study Europe-wide data harmonisation requirements. Seventeen national 'focal points' will also be established to channel information through data gathering centres at national, regional and local levels.

In the future, the EEA will begin monitoring the implementation of European legislation, prepare 'environmental labels' and promote green technologies and services. It is also committed to publishing a report on the European environment every three years.

The EEA Headquarters in Copenhagen, Denmark.

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Taking Stock and Looking Ahead

Held in Luxembourg last December, the Interfaces '94 Conference covered the results of the Interfaces of VALUE and looked to the Interfaces' future within the Fourth Framework Programme.

Interfaces II & III of the VALUE II Programme (1990-1994) developed pilot actions in four main fields:

- interdisciplinary dissemination and exploitation of research results (Interface II);
- analysis of public demand and new requirements (Interface III);
- communication of scientific and technological knowledge to the public (Interface III);

■ assessing the social impact of science and technology (Interface III).

The conference last December began by examining the multidisciplinary studies on management, economics and communication of RTD in the scientific community. Discussions centred on the attitudes and needs of corporate researchers and managers and concluded that more direct interaction should be encouraged to put the lessons learnt into practice.

The conference also concluded that the models of networking, coordination and training developed under the European Technology Assessment Infrastructure (ETAI) were essentially sound, and asked the EC to implement these support structures where appropriate.

The creation of public awareness regarding the essential role of local economic actors and citizen groups in exploiting RTD results led to a demand for a policy recommendation on issues which should be treated by Awareness Scenario Workshops. Several EU-level organisations endorsed the methodology and asked for continued support in applying it.

Future Work

1995 will see the results of 19 ongoing projects spurring further recommendations and pilot EC services in these fields. Various workshops, handbooks and a complete training course and multimedia training package for organisers of awareness scenario workshops will be produced. When these ongoing activities are concluded, most of the current elements of the Interfaces will be continued:

■ **ETAI** - selected elements are likely to be implemented in the European Technology Assessment Network initiative of the Targeted Socio-Economic Research Programme (DG XII);

■ **Awareness actions & communication of S&T to the public,** to be run by Unit DG XIII/D-2 (see Box, page 9), will focus on increasing public interaction with EC RTD results;

■ **Interface II studies** will be directly exploited by DG XIII/D-4 in connection with the workshops and networks run under the European Innovation Monitoring System.

Lastly, project reports of completed Interface activities are now available, as well as a general information package, a catalogue of specific reports and the Interfaces Bulletin.

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► INFORMATION TECHNOLOGY

IT Awards: Deadline Extended

The deadline for submissions for the first Information Technology European Awards (ITEA '95) has been extended to April 30.

The Information Technology European Awards (ITEA) were launched by DG III (Industry) of the European Commission, in conjunction with Euro-CASE(1), at the European Information Technology Conference last June(2). The deadline was extended to give the EU's new Member States enough time to get involved.

ITEA promotes standards of excellence in European information technology and stimulates innovation and competitiveness in industry. The new scheme aims to become distinguished for its excellence, objectivity and relevance to business and society.

Each annual ITEA competition will focus on technological developments, innovative IT products and the application of IT in promoting industrial competitiveness or for the benefit of society. The theme for ITEA '95 is "Novel products with a high IT content and evident market potential". The product should be at least a demonstrable prototype and, if already marketed, should have been introduced onto the market by January 1, 1994.

Three prizes of 200,000 ECU each and twenty prizes of 5,000 ECU each will be awarded. The selection criteria include:

■ technical excellence;
■ innovative content;
■ potential for improving competitiveness;
■ potential market value;
■ capacity to generate employment by opening new markets or starting up new enterprises;
■ contribution towards extending the acceptance and understanding of information technology by society.

The Awards Ceremony will take place during the European Information Technology Conference (EITC '95) in Brussels on November 28, 1995, where all the finalists will demonstrate their technologies.

(1) Euro-CASE, the European Council of Applied Sciences and Engineering, is a non-profit organisation consisting of Academies of Applied Sciences and Engineering from 14 European countries.
(2) See edition 5/94.

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► TECHNOLOGY PROJECTS

Call for Proposals

The Third Activity is aiming to publish a Call for Proposals for Technology Validation and Technology Transfer Projects on March 15.

THE THIRD ACTIVITY

The Third of the four Activities of the Fourth Framework Programme (1994-1998) is devoted to disseminating and exploiting research results. It selectively builds upon the earlier VALUE and SPRINT programmes (see editions 1/94 and 2/94) and was profiled in edition 1/95. It is run by DG XIII/D.

The Call proposal builds on the experience gathered through both the SPRINT Programme's Specific Projects and the VALUE Programme's Exploitation Projects(1). Apart from helping the companies involved, the projects will help establish an effective 'demand driven' Europe-wide technology transfer infrastructure and provide valuable data on technology transfer and dissemination.

Complementary Projects

The Call for Proposals in fact concerns two types of projects:

Technology Validation Projects validate the application of mature RTD results in fields of activity other than those for which they were intended. Ideal proposals will:

- focus on exploiting successful RTD results from both European and national Programmes across Europe;
- maximise the benefits of emerging technologies to new uses and users, including SMEs, in other regions and industrial sectors;
- establish partnerships to manage the exploitation of RTD;
- demonstrate that there is sufficient market potential and that the partners have a clear and sensible strategy on issues such as IPR, marketing strategies and so on.

Technology Transfer Projects, on the other hand, aim to transfer and diffuse existing technologies across sectoral and national boundaries towards new users. Ideal proposals will:

- involve existing technologies which do not require further R&D, although they may be adapted to new uses. Emphasis may be given to projects diffusing newly emerging technologies, such as IT, to improve aspects of the public good (e.g., environmental/working conditions, healthcare). Note that modern management techniques are considered as valid 'technologies';
- respond to a technology need, particularly those of SMEs or local authorities, rather than be driven by an available technology. These needs should be solidly based - needs expressed through regional agencies or trade associations would be particularly interesting;
- include a balanced mix of partners (e.g. technology providers, brokers and users).

Proposals must demonstrate that the project is both technically and economically viable and that all partners have the necessary resources. There must also be quantifiable benefits at the European level and for Community policies - a positive impact on industrial competitiveness, improvements to social and economic cohesion and/or environmental benefits, for example.

Two-Phase Projects

The deadline for proposals is June 15. The selection process should be finished by mid-September. Selected projects will enter a 'definition phase', expected to begin in the last quarter of 1995 after the drafting and signing of contracts.

The main aims of the definition phase are to:

- refine the workplan;
- gather data;
- examine Intellectual Property Rights (IPR) issues;
- study the market potential and social/environmental impact;
- identify and incorporate any necessary new partners;
- define the technical/economic and managerial goals.

Following the definition phase, some of the projects will go on to a main 'demonstration phase', which should start in 1996, depending on the duration of the definition phase.

The demonstration phase for technology validation projects will include adaption/validation and the real application of the results. This could involve, for example, scaling up a technology from laboratory to industrial level, tests under real conditions, prototypes to demonstrate industrial feasibility and so on.

Similarly, the demonstration phase in technology transfer projects will cover the implementing of diffusion/transfer and the adaptation of technologies by new users, including demonstration at user sites and managerial, organisational and training aspects.

The duration of the demonstration phase should be no longer than 2-3 years, involving from 3-10 persons per year. Financial support for this phase will vary, but will generally represent 30-50% of the total project cost, although levels of support may vary for different types of partners or tasks.

(1) Dossiers on VALUE and SPRINT can be found in editions 1/94 and 2/94 respectively.

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Saving Precious Fish Stocks

The Danish Relay Centre played a key role in helping the British and Danish partners in an aquaculture project exploit the results of their research.

Combined infra-sound and electric fields guide salmon around a Scottish hydroelectric dam via a fish ladder (background).

The project, launched under the Agriculture and Agro-Industries Programme[1], was entitled 'The Development of a Non-Physical Fish Fence System Using Combined Infrasonic and Electric Fields'. It was led by the Danish Technological Institute (DTI) and involved three other companies and research institutes from Denmark and Scotland.

"The idea is to scare fish away from entering the turbines of hydroelectric power plants and the cooling water inlets of fossil fuel and nuclear power stations," explains Mike Clegg of Simrad Osprey, the Scottish company who initiated the project. "This is quite a large problem - these installations can seriously dent stocks of migrating fish such as salmon, an important cash crop."

Simrad Osprey had been working on the problem for several years. By the early 1990s, according to Mr Clegg, "we saw that we needed more R&D than we could fund ourselves, so we looked to the EC's R&D Programmes. We teamed up with the Danish Technological Institute, who, having been involved in EC Programmes before, ended up leading the project. Our other partners are the UK-based Institute of Offshore Engineering and Danish company Videbaek Hoejttalerfabrik, or VIFA."

Pavlov's Fish

There are many techniques for frightening fish, but none are very reliable. The earliest ideas used electric fields - a system for stunning fish in this way was patented in 1860, for example. When it comes to frightening fish, however, electric fields have a problem - as the fish cannot 'see' where the electric shock comes from, they easily end up swimming the wrong way.

More recently, researchers at Oslo University found that fish are startled by an 'infra-sound curtain' - a planar field of low-frequency sound waves. While the fish turn away at first, however, they eventually learn that the infra-sound poses no real danger, and end up ignoring it.

Simrad Osprey's concept combines both techniques. "The fish first senses the infra-sound curtain. If it forges ahead it then gets a small electric shock, so it associates the two events," Mike Clegg explains. "The system actually teaches the fish to turn away from the infra-sound. It's quite Pavlovian, really."

Launched in September 1992, the project combined the talents of its partners. Simrad Osprey built the electric field system and the control assembly for the array of 20 acoustic transducers needed to generate the infra-sound curtain. The transducers themselves were built by the Danish Technological Institute, using magnetic coil assemblies specially designed and built by VIFA, experts in the field.

Finally, the Institute of Offshore Engineering (IOE), part of Heriot-Watt University, Edinburgh, supplied crucial marine biology expertise and testing facilities. It was IOE which tested the fishes' reaction to the combined infrasonic/electric field.

Relay Centre: Adding Value

By September 1993 the project was halfway through and Simrad Osprey were testing the integrated system at their laboratories in Aberdeen. It was then that PUF, the Danish Relay Centre, contacted the partners after a search

through the CORDIS databases.

"When we first contacted the partners it was clear that they were still immersed in the technical details, and hadn't yet considered the exploitation phase," recalls Rasmus Offersen of PUF. "We first contacted the Danish patent office to see whether the invention, or parts of it, could be patented."

The result was positive - some of the ideas were novel and could be patented. "However, as the systems would be reasonably invulnerable to imitation, being hidden under several metres of water, it was decided that secrecy was more effective in protecting the technology," Dr Offersen continues. "For one thing, publishing a patent would expose some technical details. And, of course, filing the application and extending it internationally would cost money."

According to Mike Clegg, however, PUF were able to help in another important way. "Although all partners basically knew how they wanted to divide up the marketing agreement and royalties, no-one had the legal resources necessary to sort it out. PUF took on that job, allowing us to get on with our trials."

Worldwide Markets

Thus while these trials were being carried out in the IOE's huge floating fish cage off the Orkney Islands, the PUF were drawing up an Exploitation Agreement. Both were a success.

"We used the prototype to divide the cage into subsections and tested its effectiveness on different sized fish," Mr Clegg reports. "The results were very impressive - 96% of the juvenile and adult salmon were deflected. We had less success with the smolt, which are young salmon in the process of turning from a freshwater into a saltwater fish."

"The next stage is to test the system in a working environment," he continues. "This will be made easier by the existence of the Exploitation Agreement, which we signed last September. It sets out clearly who has the exploitation rights - Simrad Osprey - and how much we will pay in royalties to the other partners. Getting professional legal help for free certainly smoothed the whole process."

By late 1994 Simrad Osprey was discussing trials with the managers of Scottish hydroelectric power stations, hoping to get systems in place before the yearly salmon migration in March 1995. "We see an immense market around the world, particularly in Europe and the US," Mr Clegg adds. "Power utilities in the UK and Europe have already seen the technology in action and are extremely interested - some have even asked for commercial bids. A Swiss environmental consultancy recently contacted the DTI for more information, having seen a short report in CORDIS focus. We have requests for information from the US, and are even considering using the system to keep sharks away from beaches without harming marine life."

(1) See edition 4/94 for more information on the EC Agriculture Programmes.

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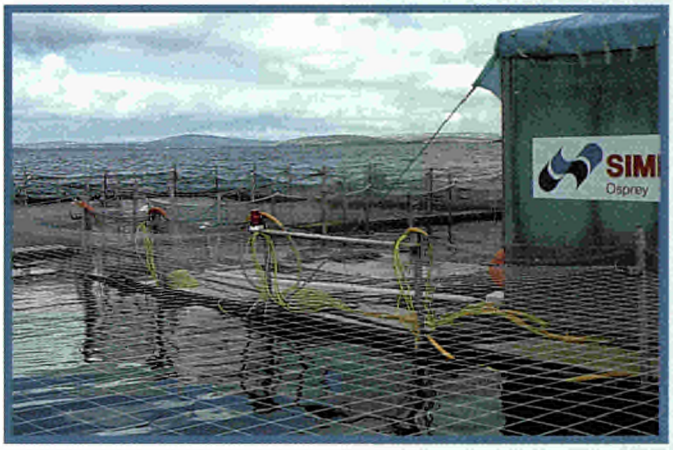

Testing the system in the IOE's floating fish cage (bottom).

► EIMS UPDATE

International Comparisons

The EIMS project 'Technology Diffusion, Productivity and Competitiveness in the TRIAD' has produced its first intermediate report. The project analyses technology diffusion and flows across industrial sectors and national frontiers in 10 OECD countries, and examines the impact of diffusion on productivity and competitiveness. In particular it explores:

- the industries in which technology originates and the industries which benefit most or least from the technology flows;
- the technological content of a given industry's or country's investment;
- the technologies being diffused, and to which sectors they flow;
- the effect of technology diffusion on productivity and competitiveness.

First results show that the ratio between acquiring technologies and performing R&D varies significantly between the US, Japan and Europe, and that technology diffuses mainly in the service sector, making these sectors as technology-intensive as many manufacturing sectors.

Further reports on productivity and competitiveness are expected to be completed in May this year.

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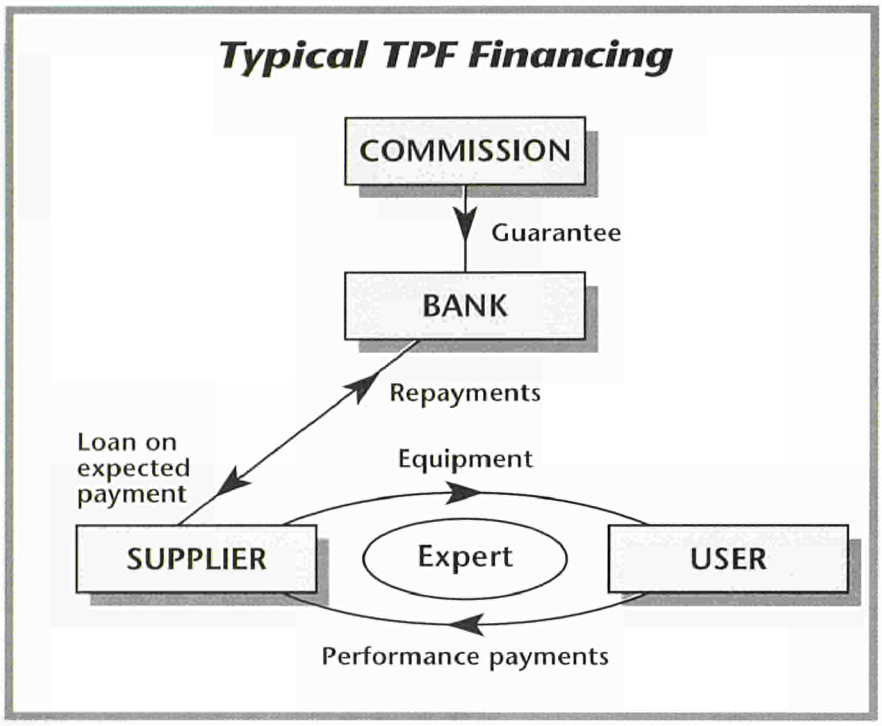
Technology Performance Financing

A financial tool being used by the Third Activity, Technology Performance Financing reduces the risks involved in acquiring innovative technology.



The TPF scheme brings all parties together to overcome the risks involved in technology acquisition.

Participating Banks

The Core Banks participating in the TPF scheme answered a Call for Proposals in 1991. They are:

- **Générale de Banque, Belgium;**
- **Unibank, Denmark;**
- **Agricultural Bank of Greece, Greece;**
- **Hellenic Industrial Development Bank, Greece;**
- **Allied Irish Banks, Ireland;**
- **Finlombarda, Italy;**
- **Banco Bilbao Vizcaya, Spain;**
- **National Westminster Bank plc, UK.**

Many SMEs throughout Europe, particularly in traditional industries, have remained resistant to introducing technical improvements to their production processes. This technological conservatism is usually based on the risk the companies perceive in acquiring technology which is not well understood or a proven success in their industry.

It is like the chicken and egg paradox - companies will not acquire a technology until it is proven, but the technology cannot be proven until it is acquired by a company.

This problem blunts the edge of European industrial competitiveness in two ways. Firstly, the businesses need to acquire new technologies and processes to remain competitive in a world without trade barriers. Many European businesses have already disappeared because they have not invested in the technology required to compete with hi-tech companies from Japan, Korea and the US and companies from countries with low labour costs.

Secondly, this technological conservatism restricts the market for the suppliers of the technology. They are usually hi-tech SMEs specialised in a small field, and lack the resources needed to force an entry into new markets.

In addition, many credit institutions, notably commercial banks and others which focus on providing short to medium term credit to firms, may have limited experience with providing risk finance to technologically innovative projects. Supplier firms have identified the difficulties in accessing risk financing through conventional mechanisms as a major constraint to growth.

Technology Performance Financing (TPF) aims to break this vicious circle by reducing the perceived risks of acquiring new technology. To do this it brings all the involved parties together - suppliers, users and financial institutions.

TPF is based on 'performance contracting', a system which has been successfully tested in the US, where it has been widely used by energy-intensive companies when buying energy-saving technology. The now finished SPRINT Programme extended this principle to include other industries.

Payment by Performance

Essentially, TPF reduces the perceived risk by linking payment for the new technology to its performance. It also offers banks and other financial institutions project-based unsecured finance and a structured framework to help them make investment decisions.

In a typical bilateral TPF scheme, the supplier furnishes the user with their innovative technologies or services. However, although the user makes an initial downpayment, the supplier receives a substantial part (up to several hundred thousand ECU) of the total cost from a bank or other financial institution in the form of a loan.

The user repays the supplier in several instalments over 2 to 3 years as a function of the new technology's performance, and may also pay a final one-off payment at the end of the project. The supplier in turn pays the bank back, with interest. Trilateral schemes may involve payments

CASE STUDY

OVERCOMING RESISTANCE TO EUROPEAN MICROELECTRONICS

In 1990 a management buy-out created a new, medium-sized company (70 staff) in the former East Germany. They soon won a German innovation award for their work in producing electronic resistor chips using SMD (surface mounted devices) technology.

They recently launched the '0402' chip, the smallest chip which will work in their customers' standard products. Until now, the 0402 has only been produced in Japan, so the company's success represents a significant achievement for the European microelectronics industry.

One of their potential customers included a German manufacturer of mobile telephones, who was interested in purchasing over half a billion 0402 chips between 1994-1996. The small German company was hoping to supply around 50 million pieces to this customer per year, accounting for a full 50% of their maximum production capacity. At world prices of 2 ECU for 100 chips, the potential annual order was worth 1 million ECU.

TPF - helping an innovative European SME break into the telecommunciation components market, replacing imported chips.

However, the customer had understandable reservations. The 0402 had only ever been produced in Japan. New developments of this kind often face technical problems, and significant failure rates on this scale represented an acute risk.

The TPF Solution

German bank Dresdner Bank brought the case to the European Commission through their subsidiary, Europa Bank in 1994. Under a trilateral TPF scheme currently being considered, the customer will receive a first delivery of 12.5 million chips, worth 250,000 ECU, this spring. They will only, however, pay the supplier one fifth of this amount to begin with, with Dresdner Bank advancing another 150,000 ECU.

The German Centre for microconnection technology in electronic R&D was brought in by the Commission to investigate the technology and define milestones regarding the chip's solderability, surface structure and so on. They will evaluate the scheme's progress.

If all goes well, Dresdner Bank will get its advance payment back from the customer in six quarterly payments of 25,000 ECU, plus normal interest. The customer will pay the supplier the last 50,000 ECU at the scheme's end. In case of problems, the bank has a guarantee from the European Commission of up to 75,000 ECU, half their initial advance.

The supplier is now planning to start similar agreements with other clients, and may also launch new agreements with the original customer for a new range of chips. The number of chips imported from Japan and elsewhere will doubtless therefore continue to fall.

directly from user to bank.

The technology's performance is judged against a set of milestones established at the beginning by the companies involved, with the help of experts who can be supplied with the assistance of the EC. If the technology performs better than expected, both the bank and the supplier may receive a bonus. On the other hand, payments can be reduced if the technology underperforms.

Lastly, the European Commission supports the scheme by underwriting a proportion of the bank's financial risk and offering the bank a guarantee against the possibility of the supplier defaulting.

Benefits for All

The TPF scheme therefore benefits everyone:

- **The Technology User** receives innovative equipment supplied at a cost determined by its proven performance, significantly reducing the risks of technology acquisition. Paying by instalments reduces the financial burden further.
- **The Technology Supplier** sees the lowered risk translated into increased sales opportunities, and may receive performance-related bonuses.
- **The Bank/Financial Institution** accesses a whole new market and may receive high returns if the equipment performs well. The expert assistance and limited financial guarantees from the EC reduce the risk to acceptable levels.

Who Can Apply?

The TPF scheme is aimed at both traditional industries and high technology companies. Banks and financial institutions participating in the TPF scheme - known as 'core banks' (see Box) - will administer the scheme. However, projects based on an agreement with a non-core bank may also be eligible.

In principle, TPF could be used mainly for the acquisition of new technology related to industrial support processes. These are fundamental to the business operation but involve technologies not directly associated with the user firm's core activity. Examples include energy conservation, waste disposal, pollution control and risk prevention.

Most industries will therefore be able to find applications for innovative processes which can qualify for funding under TPF. Businesses involved in mechanical engineering, clothing, food and drinks are particularly likely to benefit from the new scheme.

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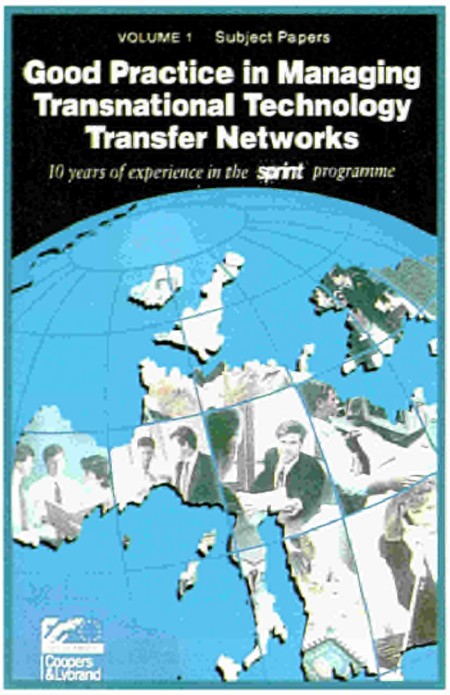
Technology Tra
A Decade of Ex



Managing the transfer of technology across sectors and across countries is a challenge that the European Commission has studied for over a decade. The SPRINT Programme, in particular, supported a large number of transnational technology transfer networks between 1984-1994. A new manual, accompanied by a CD-ROM multimedia package and a series of seminars currently being held around Europe, draws from this experience to summarise the 'best practices' in managing these networks. Its lessons should be highly useful to technology brokers, research organisations, consultancies and administrations across Europe.

I. TECHNOLOGY TRANSFER FUNDAMENTALS

Effective mechanisms for transferring and sharing technology are crucial to innovative firms. They provide channels through which they can identify and acquire new know-how in a world where both the production and value of knowledge continues to accelerate.

Small and Medium Sized Enterprises (SMEs), in contrast to larger firms, lack the in-house resources and experience to fully explore the potential of technology. As SMEs form a greater proportion of the European economy than they do in the US or Japan, their success and the international competitiveness of European industry are closely related. For this reason the EC's activities in the field focus particularly on the obstacles facing SMEs.

Technologies can be transferred both between firms and from the research world to industry. As most SMEs prefer off-the-shelf technologies and information, the first route is generally more appropriate. Sub- and co-contracting relationships, for example, usually involve transfers of know-how, while producers often transfer technology to their distributors.

In addition, SMEs are increasingly using technology licensing and other contractual forms of technology transfer. For the licensor, this provides a rapid cash return and is often the fastest and cheapest way to access new markets. The licensee, in turn, obtains a technology without reinventing the wheel, saving time and money.

Outside Support

Whatever the route, finding the right partner is the first crucial step. SMEs without the resources for this search largely rely on intermediaries. These intermediaries may also be able to support them in developing and completing a technology transfer agreement, another crucial area where SMEs have few resources or experience.

There are three basic types of intermediary:

- **Public and non-profit organisations** - regional and national development organisations, regional technology advice centres (RTACs) and chambers of commerce;
- **Research and Technology Organisations (RTOs)** - contract research firms, science parks, university-industry links and sectoral technical centres;
- **Private consultants** - technology brokers, management consultants, patent attorneys.

nsfer Networking: perience

These intermediaries fulfil different roles in the technology acquisition process. Public bodies are better placed, and often have a specific remit, to carry out broad awareness-raising programmes. RTOs often act as suppliers of technological know-how. Private companies, who need to make a living out of their activities, tend to concentrate on the provision of specific assistance to individual clients.

Why Network?

Why do these organisations form transnational networks? To begin with, networking expands a private broker's business and provides additional resources for RTOs. The services offered are not limited to any one country - technologies and customers can be found from around Europe. Networking also improves each partners' range of skills and helps build an effective set of client services.

Through the SPRINT Programme and the current Third Activity, run by DG XIII/D (see page 7), the EC is playing a major role in supporting these networks. As a result, the past ten years has seen the establishment of an effective transnational technology transfer infrastructure in Europe.

SPRINT's first action was to establish a number of inter-firm technology transfer networks linking together public and private technology transfer brokers in all Member States. Each node of these networks finds technological needs and resources among local firms and transmits them throughout the network, allowing other nodes to find a match with organisations in their area.

In addition, SPRINT established RTO networks to link together Industrial Research and Technology Organisations across Europe. These function differently to the inter-firm networks: when one RTO recognises that a nearby company has developed a useful technology, it transfers this technology to other interested RTOs in the network, who in turn transfer it to local companies.

Today there are around 100 of these networks linking over 600 organisations together across Europe. SPRINT also developed workplans specifically designed for the different organisations, reflecting their methods and priorities. Lastly, SPRINT took over 20 Specific Projects, each encompassing the complete technology transfer process for one individual technology, through to the implementation phase.

II. BEST PRACTICES

'Good Practice in Managing Transnational Technology Networks' distils the experience gained through these activities, and is intended for all varieties of organisations involved in technology transfer.

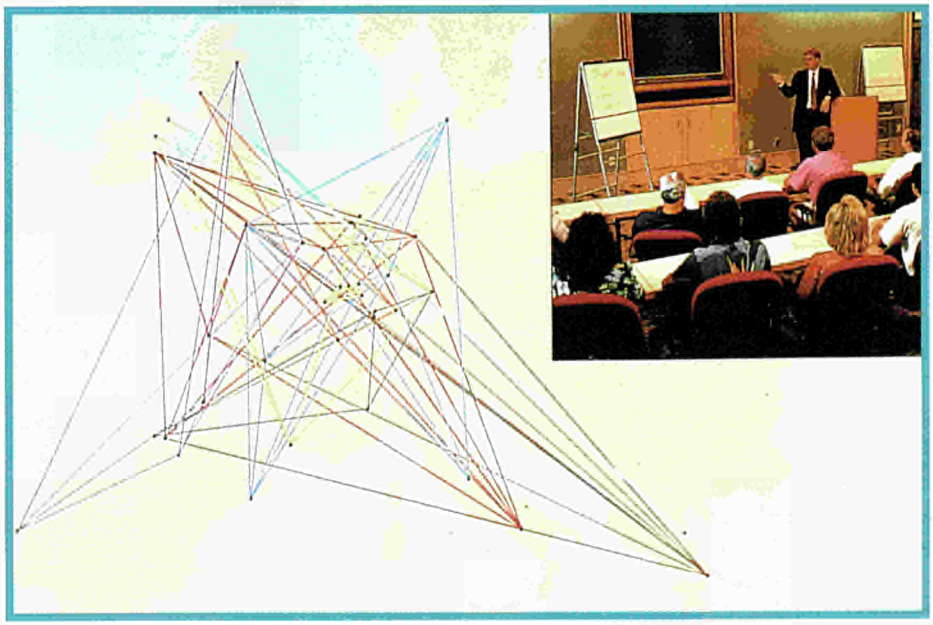
The 150-page first volume of the report examines the entire subject of network management in detail. It covers forming and running a network, achieving transnational technology cooperation, marketing the network and pricing policies. The second volume includes 25 case histories. There is also a CD-ROM multimedia dissemination tool and a series of training seminars, currently being held around Europe (see Table).

Some of the lessons found in the book, CD-ROM and seminars are covered below.

Starting Up

The market for technology transfer is essentially driven by client need, not by the availability of technologies without a proven application. In addition, technology transfer is often only a part of the overall solution - pushing a client in an inappropriate direction can lead to expensive errors.

Therefore any successful technology transfer network must be oriented towards the clients. The network structure and members must reflect this orientation.



●●● The EC's experience also shows that:
● **homogeneous networks** are generally much easier to establish and maintain, compared with networks composed of differing types of organisations;
● when forming a network, the best way of **finding partners** is to approach existing contacts. CORDIS, the relay centre network and the associations of technology transfer organisations can also help;
● newcomers should first explore the possibility of **joining an existing network** - although they will need to adapt to the modus operandi, the benefits almost always outweigh the disadvantages;
● when **negotiating the terms** under which the cooperation will take place, it is very important to reach agreement on the network's target markets, services provided, working practices and methodologies and the resources required from each partner. A framework document covering these points is recommended;
● networks have either a **generalist or specialist approach**. Generalist networks have a large pool of technology sources and clients, but can lack credibility in hi-tech areas and have trouble appraising technology offers. Networks specialising in one field do not face these problems but have a smaller potential market and can, in time, exhaust the source of new business. The trend seems to be towards specialisation;
● **how large?** Smaller networks benefit from easier communications and more controllable group dynamics, while larger networks have a larger pool of resources and a wider portfolio of potential clients. It is generally recommended to start with a network of 3-5 partners and to expand slowly and carefully;
● **the network's structure** evolves over time. The report identifies four basic network structures:
- **'star' network** - a lead partner, standing out in terms of experience and strength of personality, plays a central role. Good for beginning networks, less so for heterogeneous networks;
- **'nodal linkage' network** - there are no special, privileged relationships, and the lead partner's role is primarily administrative. Suited for partners on an equal footing;
- **'ad hoc' networks** have no formal structure. The partners have a lot in common and know each other well. Natural for mature networks, unsuitable for heterogeneous networks;
- **network of regional networks,** a complex, multi-tiered structure linking local networks through an international backbone. Only suited to supporting specific, limited duration projects with heterogeneous members.

Training Seminars

A series of training seminars covering these issues have already been held across Europe, but most of the host organisations are planning a second round for 1995.

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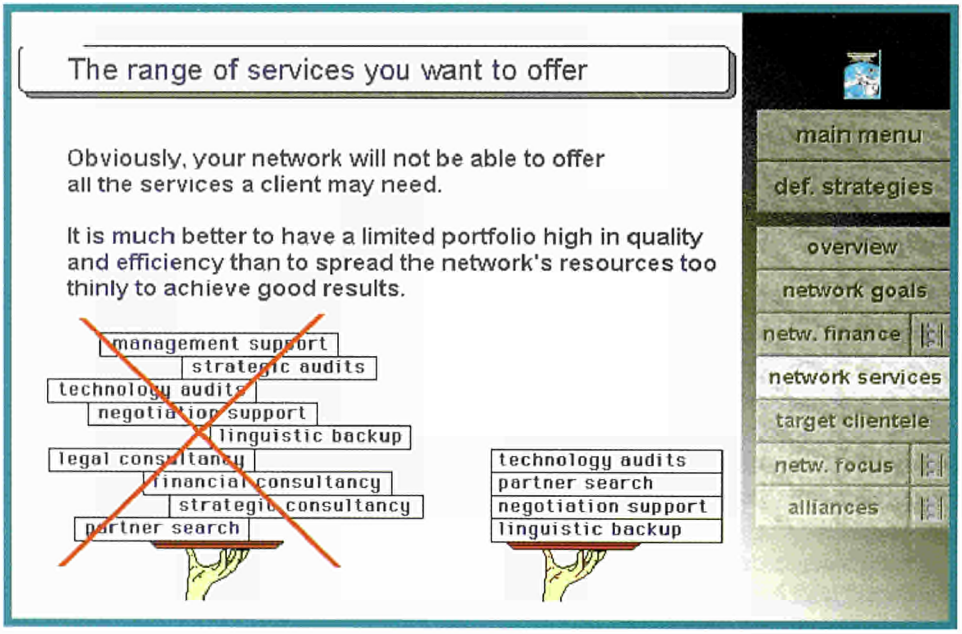

A CD-ROM based multimedia tool has been developed to help disseminate best practices in managing transnational technology transfer networks.

Working Together

How can a network be kept functioning efficiently?
● Networks usually need a **network driver** to take the lead role. He or she possesses excellent inter-personal communication skills and understands each partner's expectations and objectives.
● Rules of procedure are useful for supporting the network, but can never substitute for **good working relationships**. Individual friendships, however, can mask basic problems.
● The most active networks hold 2-3 plenary (i.e., all partners) **network meetings** per year, with bilateral meetings as needed. New networks should hold ●●●

Trading Technology for Market Access

A French and a British SME, both specialising in different applications of the same basic technology, linked up through a SPRINT network to expand their markets and product ranges.

In 1991 the local authority of the French département of Yvelines, near Paris, selected ADVANS International, a private consulting firm focusing on the international development of SMEs, to carry out a local development programme.

"The Yvelines authorities asked us to help local SMEs form partnerships with British firms, because the potential for such link-ups at the time was particularly good, due to the state of the two countries' economies," recalls Aurore Guinet of ADVANS. "As our SPRINT network links us to Morrison Miller Associates, a British technology broker, we were well placed."

ADVANS started by contacting around 500 manufacturing SMEs throughout the département. They then carried out a 'pre-diagnostic' on each of the 23 companies which registered some sort of interest. This phase included audits of the companies and market studies of their technologies in Britain. An upfront fee was also requested.

"This payment helped screen the real candidates from the casually interested," Mme Guinet continues. "Seven companies dropped out and another six were more interested in other countries, leaving us with ten clients genuinely interested in UK partners. We sent details on them to MMA, who started a partner search."

Product Diversification

One of these French companies was STPM, an SME specialised in precision bent wire products. Almost their entire business was dominated by supplying two car manufacturers with seat supports, so they saw a real need to diversify.

"STPM had two options in diversifying their business - finding new clients for their current products, or developing new products altogether," observes Iain Miller of MMA, a consultancy specialising in the 'Europeanisation' of SMEs. "We explored both possibilities, contacting British car seat manufacturers and finding British companies interested in STPM's technology."

MMA found that the equipment STPM uses to make their products was actually manufactured in Britain. A visit to the equipment manufacturers produced a list of British companies using the same or similar equipment for other products. One of these companies was Hilson, another, equally specialised SME.

Transferring the manufacturing technology, rather than the product itself, opened up the European market for British SME Hilson.

Accessing New Markets

Hilson supplies a key component in the air filtration systems used in a wide range of manufacturing processes. "Fertiliser manufacturers, for example, need to purify the air used in their processes before they emit it into the atmosphere," Mr Miller explains. "The filters are usually some sort of fabric. What Hilson makes is the support for this filter. Each 'filter cage' is a custom job, because it needs to be the exact size and shape to fit into the users' equipment. This requires highly precise wire bending and welding technology."

Hilson were doing well in Britain, but were having limited success elsewhere. The reason was simple. A filter cage may be light, but it takes up a lot of volume - only so many fit into a truck or train. This makes it expensive to transport, raising prices in direct proportion to the distance from the manufacturing plant.

To enter the continental market, therefore, Hilson required a manufacturer on the spot. ADVANS and MMA put the two companies together, resulting in a technology transfer licensing agreement where Hilson supplies STPM with know-how and equipment, and STPM manufactures and sells the product, marketed under the new 'EUROCAGE' brand name. Hilson received a one-off fee for the original technology transfer and continues to receive a royalty on each unit sold.

In this way both companies benefit, with Hilson extending their geographical market and STPM gaining an entirely new product line and technological capacity.

"STPM is just one of six French companies that signed agreements with British companies as a result of the collaboration between the département of Yvelines and our SPRINT network," Mme Guinet concludes. "Each agreement proves that there is a demand for technology transfer across European borders, and that networks such as ours can meet the challenge." □

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plenary meetings at least every three months for the first year or two.

- The **financial arrangements** between the partners must be absolutely clear. Nothing is to be gained, however, from holding partners accountable for every last penny.
- **Performance management systems** look attractive but are not easy. Wait until some experience has accumulated. Such a system is there to support the network - don't let it lead its own life.
- Deliberate **under-performance** by a partner is rare. Be sensitive to their circumstances but do not let a consistently uncooperative partner ruin the network.

Making the Network Pay

The communication costs, travel expenses and human resources spent on a network can be significant. Balancing these costs with the generated income is obviously vital to private firms, and increasingly important to public and non-profit organisations.

Ultimately, income is from two sources:

- **external funding** - subsidies obtained from external public or private sources;
- **internal funding** - fees paid by clients.

Obtaining public funding is usually straightforward once the qualifying conditions are fulfilled, but the amounts available are generally modest and the timescales involved can be lengthy. Private sector funding can be more substantial but equally more difficult to secure.

Different funds exist at regional, national and European levels for particular industries, specific regions and technology transfer activities. Accessing them therefore depends on the nature of the network members and the network's aims and location.

Some networks put part of their external revenue into a 'recycling fund' to demonstrate the feasibility of a technology or increase the chances of successfully transferring it. A small percentage of the profit generated is then used to replenish the fund.

Charging clients (internal funding) is complicated because technology transfer services are not tangible, and results often take months or even years to materialise. The traditional method of consultancy services - charging clients for time spent - is being superseded by a results-oriented, 'value-pricing' approach.

There are three basic arrangements possible:

- **'no result, no fee'** - attractive to clients, but dangerous for the network member;
- **fixed fee** - safe for the network member, but unattractive to clients;
- **intermediate solution** - such as charging a basic fee plus a 'success bonus', or linking payments to successfully passed milestones.

Auditing Clients

Even the most commercially oriented and experienced technology transfer practitioners achieve no more than a few signed agreements out of every hundred leads. Selecting only clients with the best potential is therefore vital. Concentrating on technology requests, rather than technology offers, also helps focus the work on the clients.

In brief, good clients:

- correspond with the network's 'client profile';
- are firmly committed to the project - a non-refundable deposit to ascertain commitment and enthusiasm is often a good idea;
- want to work with foreign companies - prior positive international experience is a good indicator;
- are financially solvent.

Any successful technology transfer project must begin with fully understanding the client's needs and aspirations:

- **a technological and organisational client audit** is usually the best first step. Examine the client's structural strengths and weaknesses (finances, product and market strategies, etc.) and managerial and technical maturity. The MINT Guidebook and RTAC Tools Guide (see Further Reading) can help here;
- using a **common method** for this assessment makes it easier for the other network partners to understand the new client. Similarly, a structured technology description makes it easy to identify good matches quickly. Sample assessment sheets are provided in the report's Annexes.

Closing the Deal

The next step is to find the client one or more suitable partners from around Europe and bring them together. There are four basic steps:

- **identify some potentially suitable partners;**
- **assessing the 'match'** between the potential partners and the client, using audit methods similar to those used in assessing the client;
- **the first meeting:** this is a crucial step. No detail of planning is unimportant - apparently trivial issues such as location and time must be chosen with great care;
- **following through:** the involved network partners have to stay in close contact with their respective clients, providing support wherever needed and dealing with outstanding questions promptly.

Lastly, of course, the client's confidence in the network is crucial. As the report states, "When you genuinely have your client's best interests at heart, it will show. Together with your enthusiasm, it is perhaps the best guarantee of ultimate success."

Further Reading

The following publications are available free from the Technical Assistance Unit:

- Good Practice in Managing Transnational Technology Networks;
- MINT Guidebook for Business and Technology, a review of tools and techniques used by technology transfer practitioners;
- RTAC Tools Guide covers a wide range of methodologies and computer tools, many developed by the RTACs themselves;
- Technology Transfer Days, a short brochure;
- Practical Guide for Preparing Technology Transfer Contracts, provides substantial background to the functional analysis of technology cooperation projects preceding the drafting of an agreement, and gives guidelines for the drafting of contracts themselves.

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The Snowball Effect

When a SPRINT network linked three companies together to distribute an innovative soil sensor, the technology transfer went further than expected.

In 1993 MST Aerospace, a technology transfer broker in Cologne, were contacted by IMKO, an SME based near Karlsruhe. They had developed and patented an innovative soil humidity sensor and were looking for partners to help distribute it across Europe.

The sensor is intented for farmers, who need to know soil humidity to manage their crops. Usually farmers have to take soil samples to a laboratory, where they are slowly dried.

The new sensor is simpler, faster and more accurate. The farmer simply inserts the sensor's probe - a set of three parallel rods - into the soil. A pulse of energy flows down the probe, is reflected at the tip and travels back to the sensor. Being an electromagnetic wave, the pulse's travel time depends on the soil's water content, so the sensor can immediately calculate the humidity of the soil - or indeed of any other material.

Technology Available ...

MST Aerospace are linked through a SPRINT technology transfer network with similar organisations in Denmark, France, Scotland and Spain. In addition, all five brokers have their own networks of agents in other countries, who often play an important role in finding clients for technology offers and demands received by the network. Between them, the network partners and their agents cover around 12 countries, ranging from Spain to Sweden.

"Our German partner first produced a detailed assessment of the company, their technology and what they were interested in," recalls Mr Marechal, the 'network driver' from the Toulouse office of French member NOVESPACE. "Our network uses a standardised set of forms for this, so when they sent it to us for dissemination throughout the network we could all see that it was an interesting technology."

... Distributors Found

French company MTE Instruments and Danish company Dansk Automation & Analyse soon expressed interest, but wanted more information. NOVESPACE and Danish Technology Transfer (DTT), their Danish network partner, took their queries back to IMKO. The companies liked what they heard, and business meetings were arranged for them to see the technology in action.

IMKO's innovative sensor is being distributed throughout France and Scandinavia by their new partners, found via a SPRINT network.

"The meetings were very successful," Mr Marechal says. "MTE Instruments teamed up with IMKO to demonstrate the technology at two international exhibitions held here in France. The idea was to show the technology to potential customers in France and gauge their reaction. The reaction was positive, so the two companies signed a contract allowing MTE Instruments to distribute the sensors in France. They've already sold several units."

Dansk Automation & Analyse signed a similar contract, and have started distributing the sensors throughout Scandinavia. But possibly the most interesting result - for all companies concerned - are the further developments both the French and Danish companies foresee.

New Applications

"Both companies realised that the technology could be adapted to other applications. Dansk Automation & Analyse even made an in-depth market survey to confirm their idea," explains Mr Marechal. "Fortunately, they saw different applications, making negotiations relatively simple. Both companies made licensing arrangements which allow them to work with IMKO on developing the technology for the new applications, which are, of course, confidential."

IMKO is now involved in two separate technology development projects with their new distributors in Denmark and France. MTE Instruments have also enlisted a French laboratory for additional expertise.

For Mr Marechal, the network's success stems from its professional focus. "We only accept payment upon a result, which is very attractive to SMEs," he notes. "It means that we, however, cannot be complacent. In fact, we would not be able to adopt such a policy without SPRINT's support, which was also instrumental to the network's creation and subsequent extension."

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Watch-CORDIS: The New Version

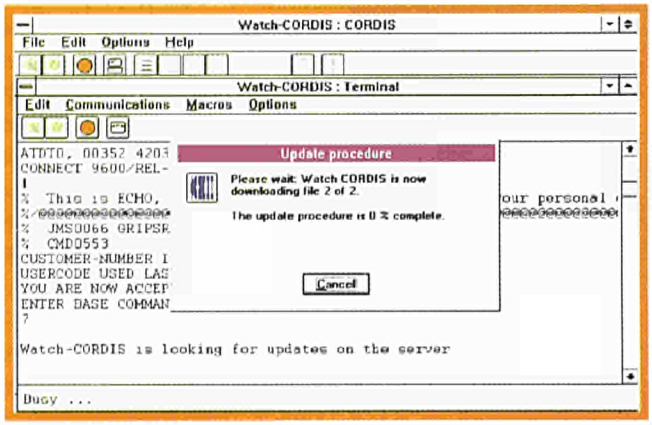
The first complete version of the Windows-compatible CORDIS interface has been released. A new database of Expressions of Interest has also been added, while other databases have been expanded in scope.

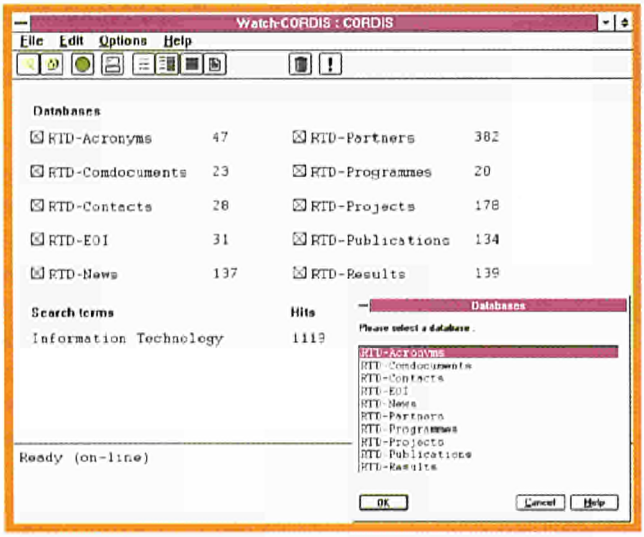
Watch-CORDIS Equipment Requirements

To run Watch-CORDIS you will need:

- an IBM AT (or 100% compatible) PC, with an 80386-based processor or higher;
- at least 4 Mb of RAM (8 Mb recommended);
- a hard disk with at least 4 Mb of free space;
- one 3.5 inch disk drive;
- a telephone, PSDN or PC/NFS connection;
- MS-DOS (version 3.0 or higher) and Microsoft Windows (version 3.1 or higher).

The first prototype version of Watch-CORDIS (WINDOWS access to central host - CORDIS), was brought out in 1994 to bring the CORDIS service to a wider audience, particularly smaller companies lacking database expertise.





The Watch-CORDIS update procedure (top) makes it 'future proof'.

Users can now search any or all databases simultaneously (bottom). Documents can then be retrieved from each database.

The user-friendly interface makes using CORDIS easier and, because all database queries can be prepared before connection, significantly cheaper.

Watch-CORDIS ver. 1.12, currently available from the CORDIS Help Desk in Luxembourg and also carried on the current edition (1/95) of the CORDIS CD-ROM, includes new features such as a 'global search' facility, allowing users to interrogate any or all of the CORDIS databases with a single search query. The new programme also automatically updates itself, so that any changes introduced to CORDIS can be downloaded, making the programme 'future-proof'.

Expressions of Interest

The new version also allows access to the new database of Expressions of Interest (EoI) for the new Information Technology (ESPRIT) and Telematics Applications R&D Programmes. EoIs are submitted by companies and research institutes to attract other partners to their proposals or to offer their services for collaborative R&D.

EoIs for both Programmes can be submitted via the relevant Programme's National Contact Points, who also supply the forms. In addition, EoIs for the Information Technology Programme can be submitted electronically via the CORDIS World Wide Web Server (Internet address: http://www.cordis.lu), a much faster procedure.

The RTD-EOI database allows organisations to search the EoIs submitted for both Programmes. Fields specific to the new EoI database include 'Area of Interest', 'Proposed Role' and 'Participation Type'. Otherwise it is quite similar to the RTD-Partners database.

RTD-Partners, in fact, also contains more than 3,600 EoIs submitted since September last year for the Advanced Communication Technology and Services Programme. In total, the database grew by almost 9,000 entries in 1994, covering all Community-funded R&D. Usage figures for January 1995 reached 900 hours - a new record.

Users can place their own entries onto RTD-Partners. Electronic entry forms are available on the CORDIS CD-ROM, Watch-CORDIS and by sending an e-mail message to cordis-cp@lcd.co.uk. They can then be filled out using wordprocessing software and returned by e-mail, or printed out and returned by post. A paper entry form can be obtained from the CORDIS Information Collection Unit.

RTD-Projects: Expanded Coverage

The RTD-Projects database now contains more information on each participant in each project. Until recently it was possible to view the full address of the project coordinator only. Since the beginning of 1995, however, the database's "PAR" (Participant) field provides contact details for all project partners.

RTD-Projects was set up to answer queries such as:

- I've heard of an interesting project, but where can I find additional information?
- how can I know whether a particular research area is being financed?
- who in my region is carrying out research in my area?

The database provides information on around 23,000 past and present projects, covering aims, descriptions, references and current status. Many Community-funded Programmes are covered,

particularly the Framework Programmes of research and technological development. The vast majority of Third Framework Programme projects are already included, with the remainder, all of which started recently, being added in the very near future.

ACCESSING CORDIS: A SUMMARY

As the European Commission brings the Research Programmes closer to more and more Europeans, access routes to the CORDIS databases are multiplying. Here is a summary of the possible methods.

■ **No computer:** All EU member states have local organisations supplying CORDIS information, including the Relay Centres run by DG XIII/D-3, chambers of trade, and so on (contact the CORDIS Help Desk). In addition, there is a range of publications, available through the RTD-Help Desk, containing extracts from some of the databases. These are *CORDIS focus* and the associated *CORDIS focus* RTD-Results supplement (RTD-News and RTD-Results extracts, respectively), as well as *Euroabstracts* (from RTD-Publications).

■ **Computer lacking communications:** If you have a CD-ROM drive, use the CORDIS CD-ROM, available from the CORDIS Help Desk. Otherwise, see above.

■ **Modem and telephone voice line:** Speed: 300-9600 baud; Full duplex; Even parity; 7 data bits, 1 stop bit; TTY or ANSI-BBS terminal emulation. Dial: +352 42 03 47.

■ **Modem and PSDN connection:** Speed: determined by PSDN; Full duplex; Even or No parity; 7 data bits, 1 stop bit. ECHO NUA for seven bit access: 0270448112 (UK only: A9270448112).

■ **Corporate Local Area Network:** talk to your LAN administrator.

■ **Internet Connection:** Command: telnet echo.lu

■ **World Wide Web connection:** The WWW Server at http://www.cordis.lu provides information on CORDIS and the activities of DG XIII, as well as electronic document delivery of Work Programmes and Calls for Proposals for most of the Fourth Framework Programme.

Contact

■ **CORDIS Help Desk**
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■ **RTD-Help Desk**
Tel: +352 4301 33161
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■ **CORDIS Information Collection Unit (RTD-Partners forms)**
Tel: +32 2 280 1744
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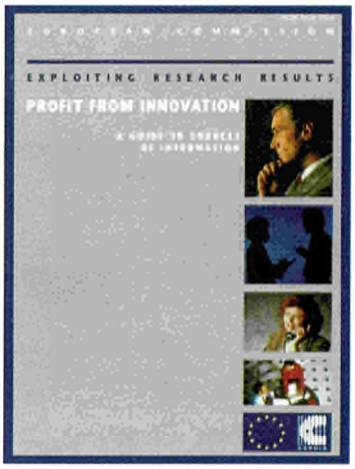
► NEW PUBLICATION

Profit from Innovation

A new information guide has been prepared to help British companies exploit research results. More guides focusing on other EU countries will follow this year.



Profit from Innovation, the first in a series of new, 'country-specific' publications from the European Union, will show British businesses how to take an active part in developing the technologies of the future.

Prepared by DG XIII-D under the VALUE Programme (1990-1994), the 120-page book(1) provides an extensive guide to EU and UK research and development programmes, and concentrates particularly on the resources and services set in place at UK and European level to help companies and research organisations commercialise research results.

It is divided into 10 chapters:

■ Introduction;
■ EU research policy and programmes - describes EU research policy and identifies the main Programmes and timescales;
■ UK research policy and programmes - describes UK research policy and identifies the main Programmes and timescales;
■ Research and development organisations - lists information sources on R&D organisations and schemes to improve partnerships with industry;
■ Product design and development - identifies organisations and programmes which can help in prototype and product development;
■ Marketing, technology transfer and exporting - covers organisations and programmes helping in the commercialisation and marketing of technology;
■ Legal aspects - describes sources of advice and help on collaboration agreements and intellectual property rights;
■ Finance and funding - identifies government and private sector sources of finance;
■ General sources of information - provides a list of general sources of information and assistance;
■ Index - a comprehensive listing of topics and an explanation of terms and abbreviations.

1995 should see similar guides published for Greece, Ireland, Italy, the Netherlands and Spain.

(1) 'Profit from Innovation', EUR 15858, £11.

Contact

HMSO Bookshops
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▶ ESPRIT

Enhancing Teamwork Through Software

The four SMEs in the MULTIDOC project have begun commercialising a new software system designed to make office-based teamwork easier and more efficient.

The ESPRIT MULTIDOC project was launched in mid-1992 by the French company Selisa Software and its three partners in Greece and Italy. The resulting Multiflow software improves the way office teams work together.

"Personnel productivity has already been massively improved by all sorts of standardised software such as word processors, spreadsheets and databases," explains Norbert Benamou of Selisa Software. "What Multiflow aims to do is carry that process a step further by tackling work at the dossier level."

In nearly all multi-person business processes, the different people in a project team work together by enriching and processing that project's dossier - a (usually haphazard) collection of documents ranging from hand-written faxes to sophisticated spreadsheets.

The Multiflow system supplies a coherent work environment for administering dossiers. Users can access their other computing tools from Multiflow and, depending on their 'access rights', use the system to:

- create, insert, delete, scan, edit and annotate documents;
- capture data through pre-defined forms;
- generate documents by gathering data from throughout the dossier;
- circulate the documents electronically throughout the relevant workgroup.

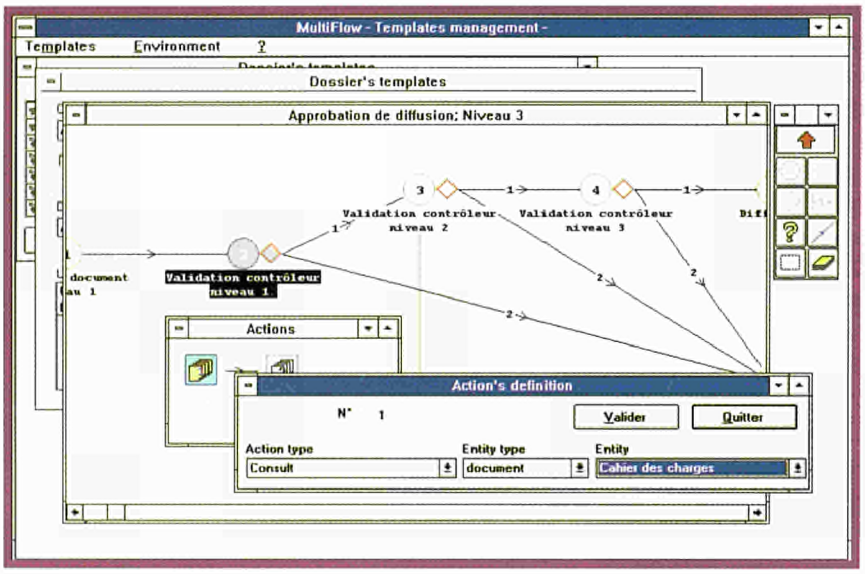
User-Defined Structure

A Multiflow dossier is not simply an electronic folder - each has a specific structure reflecting the team's procedures and the relationships between the tasks. What is more, users can embed a 'document flow' into the dossier, usually reflecting an administrative path or business process.

Reflecting the wide variety of possibilities, Multiflow allows for many different types of flows, ranging from a simple linear structure to the parallel model, where the dossier is shared between people who separately process sub-dossiers.

A set of forms and datascreens - developed using Multiflow's toolkit - can be associated with each step of this flow. In this way responsibility and decision-making procedures are clearly defined, with each person contributing at the right time with the right information.

This structure also allows Multiflow to create reports and other documents from the dossier's contents automatically, avoiding transcription errors and a proliferation of redundant and outdated information.



Multiflow - sophisticated management software developed by French, Greek and Italian SMEs.

Customer Involvement

According to Mr Benamou, customer demand played a key role in both launching and directing the project. "We had been working on document automation with R&S Informatica and Epsilon Software - from Italy and Greece, respectively - since the mid 1980s," he explains. "However we realised that there was a limited market - what we needed was to embed our work in an office management system. But we are all SMEs, ranging from 90 staff here at Selisa to eight at R&S Informatica. Without the ESPRIT funding nothing would have happened."

The project was carried out in three nine-month phases. "After nine months of work we would test the resulting system at a number of customer sites," Mr Benamou continues, "then go back and refine the software to suit the test users."

The customers' sites included French local authorities, Greek banks and insurance companies, Italian public administrations and even the Brussels-based Western European Union, the common defence component of the E.U.

The company is now in the first stages of fully commercialising the software. "Our first applications are at some of the original test sites," Mr Benamou adds. "Having systems running in the public authorities will be excellent publicity, of course, while one of our private customers - a Greek insurance company - is refining the system so as to sell it to other companies in the same field. We are also discussing the possibility of adapting MULTIDOC as a tool for business re-engineering with a number of management consultants." □

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► THERMIE

A Worldwide Approach

The last quarter of 1994 saw the THERMIE Programme promote innovative European energy technologies in Europe, Russia and South-East Asia.

Saipem's subsea robot at THERMIE's stand in Singapore.

Last December saw THERMIE take part in the Offshore South-East Asia (OSEA) Conference and Exhibition for the second time. "OSEA is one of the world's top three trade shows in the oil and gas sector," explains Peter Bigg, OPET[1] manager at the UK-based Petroleum Science and Technology Institute (PSTI). "There were almost 1,500 exhibitors and around 11,000 visitors. If Europe's offshore industry is to tap the enormous opportunities in South-East Asia, we have to be there."

PSTI, one of the few OPET network members focusing specifically on one energy sector, organised the 100m^2 THERMIE exhibition stand. It featured eight European companies and their oil/gas technologies:

- a self-retrieving offshore anchor;
- a stand-alone solar energy system for unmanned offshore platforms;
- an umbilical-free subsea power and control system;
- innovative concrete-based platform construction techniques;
- an integrated subsea separation and pumping system;
- an automatic pipeline welding system;
- a diver-less repair system;
- technologies for reconnaissance surveys, seismic interpretation and interactive 3D gravity modelling.

Early Results for SMEs

Half of the exhibitors were SMEs. Most of them, however, had not been involved with THERMIE before. "That is one of the beauties of THERMIE," Dr Bigg notes. "Most of the funding does go into demonstrating energy technologies - five of our exhibitors were demonstrating technologies they had developed thanks to THERMIE. But THERMIE will promote any European SME's energy technology. The Dutch, French and German SMEs we took to OSEA in this way all had tremendous successes."

French SME DORIS Engineering, specialists in using concrete for offshore platforms, were a typical example. Their exhibition featured their work on two world firsts - a Canadian iceberg-resistant platform and Norway's semi-submersible production platform. "People were queuing up for more information," Dr Bigg recalls. "It's still early days yet, however - we will survey the companies in a few months to assess the exhibition's impact properly."

Many of the eight exhibiting companies also brought along their SME collaborators. Milan-based company Saipem, for example, were accompanied by British SME Millstrong, with whom they are collaborating on subsea robots. According to Mike Bentley, Millstrong's Chairman, "for a small company like ours, THERMIE's support meant everything in getting to Singapore. The exhibition generated outstanding interest and enquiries are still arriving. We are now on the point of signing an agreement with one of the world's largest electronic, engineering and construction companies as a result. We never expected such a success."

Russia: Untapped Opportunities

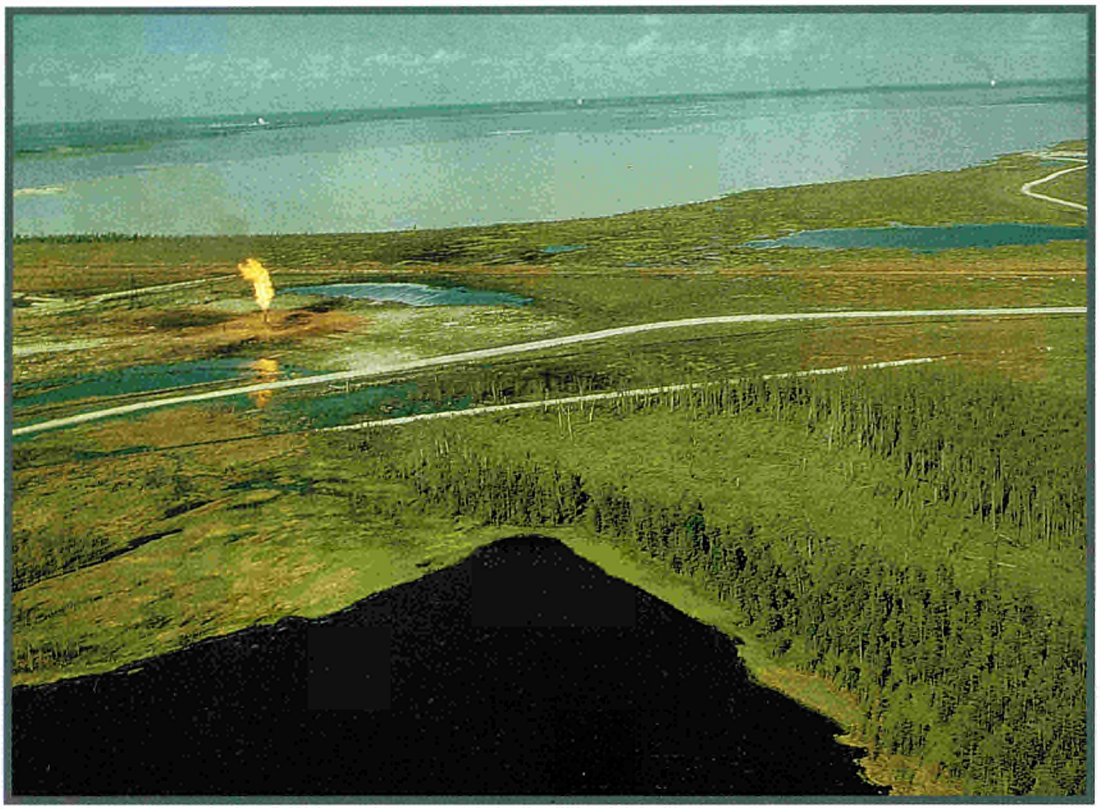
PSTI was also involved in another major exhibition in Tyumen, Russia, the previous month. "Tyumen is the capital of the largest oil province in the world, which is why THERMIE recently established an Energy Centre there," explains Dr Bigg.

The Tyumen Energy Centre is one of many established throughout Eastern Europe and the ex-USSR. The THERMIE stand involved seven European companies eager to explore the possibilities in Russia. ●●●

The EC Energy Centre at Tyumen, Russia, promotes an environmentally responsible oil and gas industry for Western Siberia.

●●● Dr Bigg sees parallels between THERMIE's work in Singapore and Tyumen - to a point. "In both cases, companies in these Third Countries are mainly interested in joint ventures and other collaborations," he observes. "They want to trade an opening into their markets for technology transfers for their own industries. Asian companies have more resources than those in Russia, however."

THERMIE is now considering expanding its network even further by opening a permanent Energy Centre in Houston, site of the world's largest oil/gas technology exhibition. Peter Bigg hopes that the next one will be in Singapore. "Energy Centres are the next logical step after trade shows, and provide European SMEs with their best chance to break into overseas markets."



The Samotlor oil field, Western Siberia - enormous potential for joint ventures.

Europe: An Environmental Focus ...

THERMIE's increasingly global scope is not reducing its activities in Europe. Last October, for example, saw THERMIE make major presentations at both the 10th International Environment and Eco-Industries Exhibition (POLLUTEC '94, Lyons, France, 18-24 October) and TERRA '94 (Bari, Spain, 27-30 October). Both events focus on the latest developments in environmentally friendly technologies, and between them attracted thousands of exhibitors from around the world.

THERMIE projects demonstrated at POLLUTEC '94 included renewable energy systems, manufacturing processes which use wastes, urban traffic management systems and bio-diesel and bio-ethanol public transport fuels.

For TERRA '94, THERMIE focused on its achievements in Southern Europe and the Mediterranean area. Less-developed EU regions in this area have seen almost 100 projects, worth almost 130 MECU, launched since 1990. A large number of seminars, workshops and business missions have also been carried out in Egypt, Jordan and the Maghreb.

... and a Regional Approach

THERMIE does more than organise exhibitions at trade shows, however. "Energy saving measures and technologies in existing buildings", held last January by OPET Member SEA (Saarländische Energie-Agentur GmbH) in Saarbrücken, for example, focused on opportunities in the Saarbrücken-Luxembourg-Lorraine region.

"This is a new idea for a seminar," explains Nicola Saccà of SEA. "It covers a classic THERMIE area - the energy renovation of existing buildings - but it also attempts to break down national boundaries within this sector by focusing on a transnational European region. In this way companies from the French city of Metz became aware of the opportunities, legal procedures and other issues in the German market."

The seminar focused on introducing energy saving measures into existing buildings. Although new technologies could produce enormous savings in terms of energy bills and atmospheric pollution, it is a difficult field. According to Mr Saccà, the largest problems have little or nothing to do with technological solutions.

"In order to achieve widespread adoption of the relevant technologies, you have to bring together a wide range of people," he continues. "You need to have building owners talking to the suppliers of the new technology. You need to educate architects and artisans. You need to prove that the technologies will pay back the required investment within an acceptable time. The seminar reflected these needs, bringing together these groups from the relevant regions of France, Germany and Luxembourg."

The seminar included six workshops focusing on the following major questions:

- **Legal Issues in Energy Renovation:** Opportunities provided by and the impact of Germany legislation; Technical and economic possibilities; Energy-saving investments to avoid. Aimed mainly at architects and building owners.
- **Better Market Possibilities:** New multi-disciplinary renovation concepts; Building cooperation between owners, architects and craftspersons for a global energy view; Practical renovation ideas; Economic aspects; Exploitation models. Aimed mainly at artisans.
- **Renewable Energy Sources in Renovating Existing Buildings:** Passive solar energy; Solar collectors; Wind energy.
- **Modern Techniques for Heating, Air Conditioning and Hot Water:** Legal aspects; Relevant German standards; Combustion technologies; Controlled domestic air conditioning; Regulating for efficiency and comfort; Remote control techniques; Comparison of heating options.
- **Correct Use of Heat Insulation:** Different materials and results; Insulating roofs, cellars and walls; Experimental and simulation results; Durability.
- **Switching Energy Sources:** Details, difficulties and solutions in switching to natural gas, piped heat and hybrid systems; Economic and ecological advantages; Energy suppliers and craftspersons. □

(1) The 49-member OPET Network (Organisations for the Promotion of Energy Technology) was established by THERMIE (1990-1994) to promote technologies that improve energy efficiency and reduce the environmental impact of energy production. See edition 4/94.

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► IMPACT

European Information: Easier Access

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Current IMPACT initiatives include a new database of contact persons and user-friendly interfaces to existing databases.

The new IDEA (Inter-institutional Directory of European Administrations) database, accessed through ECHO (European Community Host Organisation), provides contact details for the:

- Council of the European Union;
- Court of Justice;
- Court of Auditors;
- Economic and Social Committee;
- European Commission;
- European Investment Bank;
- European Parliament.

The database provides name, title, function, languages spoken and contact details. Entries on Members of the European Parliament also include a brief biography, birth place and date, region represented and date of election. The database will initially be in English only - French and German versions will be next, with other languages being added later.

Tenders and I'M-GUIDE

This spring will see two other ECHO databases - IMPACT's I'M-GUIDE database and the Tenders Electronic Daily (TED) database of EC public tenders - offer user-friendly interfaces based on the Watch-CORDIS interface.

I'M-GUIDE is the leading directory of electronic information products and services available in Europe. It contains details of more than 3,000 databases, 2,200 CD-ROM products, 3,200 organisations and 1,200 brokers. In addition, the equally user-friendly I'M-GUIDE CD-ROM will allow users to construct database queries at their leisure, updating them through their telephone line at the touch of a button.

Like the original Tenders Electronic Daily (TED) database, Watch-TED contains all information necessary to answer the public tenders published in the Official Journal of the European Communities (supplement S). Users can search the various database sections (TED-Current, TED-Archive and TED-Demo) separately or perform a global search across the entire database.

► TELEMATICS APPLICATIONS

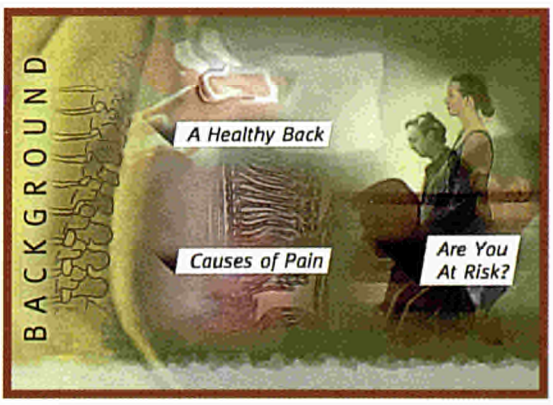
Exploratory Multimedia Projects Near Completion

Following the implementation of 22 exploratory multimedia projects, the Information Engineering sector will publish a Call for Proposals this March.

A sector within the Telematics Applications Programme (1994-1998), Information Engineering (IE) aims to develop applications which integrate electronic publishing, information dissemination and information retrieval.

Like many of the Programme's 'Horizontal RTD' sectors, IE did not issue a Call for Proposals last December. In fact, IE published a preparatory Call for Proposals the previous March focusing on exploratory actions in multimedia publishing, resulting in 22 short (six month) projects.

Together these projects are exploring multimedia applications for areas such as electronic newspapers and publishing, technology transfer, corporate and medical information systems, cultural heritage, product design, process industries and software engineering. Their findings will be incorporated into the Call for Proposals on March 15, the deadline for which is June 15. Additionally, Proposers' Days for IE and the other Horizontal RTD sectors within the Programme (Telematics Engineering and Language Engineering) will be held on April 5-7.



'ISPINE', a project supported by IMPACT in 1993-1994, explains how the back works and identifies the risks in the workplace.

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telematics@mhsg.cec.be

► CONFERENCES

INTEGRATED INNOVATION SUPPORT FOR SMEs 27-28 April, Lisbon (Portugal)

The 1995 Annual Conference of TII, the European Association for the Transfer of Technologies, Innovation and Industrial Information, will focus on integrated innovation support strategies.

These combine most or all of the elements necessary for successful innovation: good scientific/technical ideas, project management skills, risk capital, market knowledge, personnel training, technology transfer and more. They are systematically combined in a single package or transmitted via a single intermediary support organisation. English-French-Portuguese simultaneous interpretation will be provided.

Contact: TII

Tel: +352 46 30 35; **Fax:**+352 46 21 85

SIXTH JOINT EUROPEAN NETWORKING CONFERENCE 15-18 May, Tel Aviv (Israel)

The conference will address strategic aspects of open computer networking in five main themes:

- Networking technology and engineering;
- Support for cooperation work;
- Security and privacy;
- Providing and accessing information;
- Policy-related issues.

Contact: RARE Secretariat

Tel: +31 20 639 1131; **Fax:** +31 20 639 3289

WAVE ENERGY

■ **PROCEEDINGS: 1993 EUROPEAN WAVE ENERGY SYMPOSIUM**

EUR 15571 EN (1994), £56, 474 pages

This international symposium, held in Edinburgh (UK) in July 1993, discussed various areas of research into wave energy technology, including performance enhancement, air turbine configuration options, wave energy converters and existing prototypes. A review of wave energy activities in Europe, the UK, Japan and the United States is also provided.

■ **CONFERENCE: THE 2ND EUROPEAN WAVE POWER CONFERENCE**

8-10 November, 1995, Lisbon (Portugal)

The follow up to the 1993 event described above.

Contact: National Engineering Laboratory

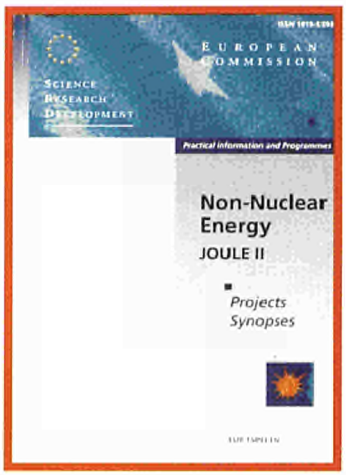
Tel: +44 13552 72079

Fax: +44 13552 72333

► PUBLICATIONS

■ **NON-NUCLEAR ENERGY (1990-1994): PROJECT SYNOPSES**

EUR 15893, 82.5 ECU, 900 pages



This book outlines the JOULE II Programme, carried out under the Third Framework Programme, and summarises the more than 400 projects, divided into four main areas:

- Analysis of strategies and modelling;
- Minimum emission power production from fossil fuels;
- Renewable energy sources;
- Energy utilisation and conservation.

■ **TRAINING AS AN ENTREPRENEURIAL BUSINESS**

£100, 8 booklets

"Training as an entrepreneurial business" is a training pack for small and medium-sized businesses produced by the European Centre for the Development of Vocational Training (CEDEFOP). It comprises a complete development programme for SME teachers and trainers and aims to improve market positioning/analysis and the management and organisation of training programmes. It is produced in eight separate booklets, comprising an introductory booklet and seven training modules:

- Assess the market and establish a position;
- Determine the training and development needs of entrepreneurs and businesses;
- Design a training programme to meet needs and objectives;
- Facilitate entrepreneurship and business development;
- Reach the market;
- Monitor and evaluate the effectiveness of the programme;
- Organise and coordinate the programme.

Contact

Durham University Business School

Mill Hill Lane, Durham City

DH1 3LB, UK

NOTE

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (issue 1/95). Publications are free unless otherwise stated.

CD-AJ-95-002-EN-C

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