

# Innovation & Technology Transfer

6/99

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Financing Innovation

**Innovation**  
= [ Technology + People ] + Capital

**Plus**

- Innovation policy managed by new Enterprise Directorate-General
- Virtual prototyping shortens the product development cycle
- A cost-effective solution to pulp and paper industry pollution
- IRCs help small companies to visit trade fairs via video link

... and more





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# Financing Innovation

It is two years since *Innovation & Technology Transfer* last examined Europe's performance in the area of innovation financing, and the measures undertaken by the European Union to improve it.

New technologies are a primary source of competitiveness and economic growth, while the new companies formed to develop and exploit them constitute the key weapon in Europe's battle against unemployment.

But lack of appropriate finance still dissuades researchers from attempting to exploit their inventions, hampers the entrepreneurs who could transfer research results to new regions and sectors, and stifles the self-reinforcing dynamism which characterises regional clusters of innovation and wealth creation such as Silicon Valley.

In the past two years there has been rapid growth in the total amount of venture capital available in Europe, to which the European Union has made an important contribution through the European Investment Bank and the European Investment Fund.

Even so, too little of this risk capital is available where it is most urgently needed, at the very early stage of high technology ventures with high growth potential.

As this edition's dossier shows, the European Commission is both intensifying its efforts to stimulate investment of this kind and launching new initiatives to address the demand side – helping to ensure that lack of entrepreneurial skills among researchers does not prevent them from securing the financial backing they need.

# Innovation & Technology Transfer



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# Innovation and Enterprise

*The appointment of a new European Commission, followed by the reorganisation of its departments, will have the effect of integrating innovation as a key element of industrial policy.*



*Erkki Liikanen, who takes over as Commissioner for Enterprise and Information Society.*

**O**n 15 September 1999, the European Parliament approved the new Commission, which took office on 16 September and held their first official meeting on 18 September.

Philippe Busquin, a former Belgian Minister who originally trained as a scientist, takes over as Commissioner for research. Erkki Liikanen, who between 1995 and 1999 served as the Budget Commissioner, will take charge of the Information Society Directorate-General and a new Enterprise Directorate-General.



Photo: European Commission Audiovisual Library 1999

*Romano Prodi's new team at the European Commission.*

## Rational and clear

The traditional numbering of the Directorates-General has been dropped in favour of short, descriptive names, while the overall number of departments has been cut by 15% – from 42 to 36 – in what Romano Prodi, the Commission President, has described as the first stage of a series of sweeping reforms to be introduced in the coming years.

The new Enterprise Directorate-General brings together the former DG III (industry), the bulk of DG XXIII (enterprise and SMEs), and the Directorate responsible for innovation – including management of the Innovation and SMEs programme – from DG XIII.

The integration of these functions reflects the perceived need for a more comprehensive approach to business and competitiveness – though the special needs of small and medium-sized enterprises (SMEs) will continue to be recognised. The inclusion of responsibility for the

implementation of the Innovation Action Plan is designed to facilitate the absorption of a spirit of innovation and entrepreneurship throughout European industry.

The remaining elements of the former DG XIII, comprising activities in the field of information and communication technologies, including the Information Society programme of FP5, constitutes the new Information Society Directorate-General.

Commissioner Liikanen's portfolio combines responsibility for enterprise, competitiveness, innovation and the Information Society. Bringing together the Enterprise and Information Society Directorates-General under a single Commissioner is intended to help the Commission to maximise the effectiveness of its response to the fundamental effect on business of the explosive growth of electronic commerce.

## Innovation a priority

As long ago as 4 May, Mr Prodi made it clear in a speech to the European Parliament in Strasbourg that innovation would remain a top priority under the new Commission. "Although the performance of most of the scientific and technological production indicators is similar, the production structure in high-technology areas is considerably weaker in Europe than it is in the United States," he said. "Europe has already made progress to improve its capacity to transform scientific and technological knowledge into business opportunities, but a strong collective effort is still needed in the area of innovation."

### Contact

Full details of the new Commission are available on the Europa server at:  
[http://europa.eu.int/comm/newcomm/index\\_en.htm](http://europa.eu.int/comm/newcomm/index_en.htm)





# European Research – A Growing Community

*In June, the Commission published its fifth Annual Report on Community research, providing an overview of policy developments and research activities undertaken in 1998. Gearing research towards innovation will continue to be a top priority, it concludes.*

**I**n 1998, the final group of projects selected under the Fourth Research Framework Programme (FP4) was launched. In all, 6,200 new projects got under way, involving around 28,000 research partners and creating over 90,000 collaborative links, 83% of them transnational.

## Increasing SME participation

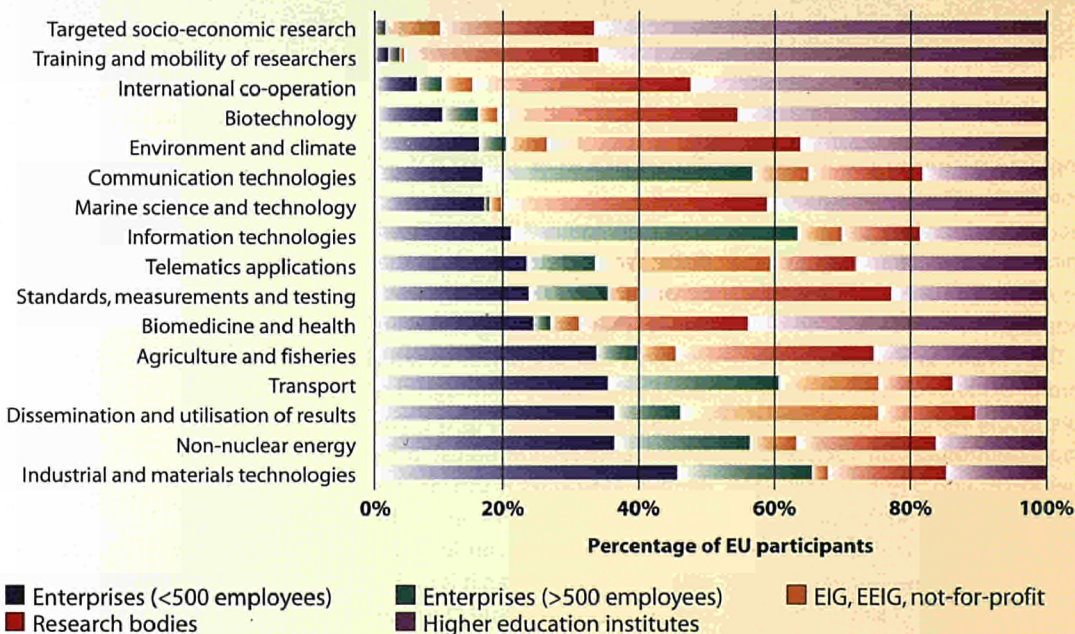
The potential for creating new high-quality jobs is concentrated in Europe's emerging high-technology sectors and the innovative, dynamic and rapidly growing small and medium-sized

ingly dependent on access to new technologies.

Industrial involvement in Community research is essential, both to ensure the rapid and efficient application of research results and as a means of strengthening the mutually beneficial cooperation between the private sector and public research institutes. In 1998, firms accounted for 38% of the participants in new research projects, and received 34% of total Community contributions to research projects.

In 1998, SMEs were defined as enterprises with fewer than 500 employees – though from 1999 onwards the definition will change to include only those with fewer than 250. They accounted for 25% of the participants in new research projects, compared with just 18% in FP3, and received 16% of total Community contributions. In all, 14,500 SMEs took part in FP4 projects between 1995 and 1998. Around 20% of these benefited from the Exploratory Awards to support the preparation of their research proposals, and 35% chose to use the CRAFT cooperative research scheme, in which a number of SMEs jointly employ a third party to undertake research on their behalf.

**Figure 1: New shared-cost projects in 1998, by research area and type of participant**



*SMEs again accounted for nearly 25% of all participations in new projects launched during 1998. Their share in the Industrial and Materials Technologies programme, Brite-Euram, was over 40%.*

Reflecting FP5's renewed emphasis on research which contributes to Europe's social priorities – competitiveness and employment, quality of life, and regional cohesion – the report assesses the impact of research to date, and confirms that these are not just positive, but fundamental.

enterprises (SMEs) which characterise them. These SMEs – for example in the fields of medicine, information technologies and environmental products and services – are not only important contributors to Europe's technological development, but are themselves becoming increas-

## Year of innovation

In policy terms, the most significant development during 1998 was the adoption of the Fifth Research Framework Programme (FP5). The report points out that FP5 as a whole was designed to



gear research towards innovation, reflecting one of the three key priorities of the 1996 First Action Plan for Innovation in Europe. But it emphasises that the implementation of the Action Plan, which entered its second phase in 1998<sup>(1)</sup>, goes beyond the co-ordination and support of the innovation activities of FP5's thematic programmes.

Several specific initiatives are highlighted:

- Throughout 1998, the Commission undertook widespread consultation on ways to create an **environment conducive to innovation** in Europe. This culminated in the first European forum for innovative businesses in Vienna<sup>(2)</sup>, following which the Commission proposed a pilot scheme to link existing regional initiatives to stimulate the creation and development of new technology-based firms (NTBFs), in order to identify and spread good practice to other regions<sup>(3)</sup>.

- The two most severe 'innovation bottlenecks' – **intellectual property protection** and innovation financing – were both addressed during 1998. In consultation with patent professionals and national patent offices, the Commission continued to prepare for the introduction of a Community patent. The IPR-Helpdesk<sup>(4)</sup> was set up, and the European Patent Office launched the *esp@cenet*<sup>®</sup> service, which offers free on-line access to over 30 million patents throughout the world.

- In relation to the **financing of innovation**, the Commission published its Communication *Risk capital: a key to job creation in the European Union*. The I-TEC pilot project<sup>(5)</sup>, which also involves the European Investment Bank, the European Investment Fund and the Structural Funds, produced encouraging initial results. It is designed to help venture capital funds to make early-stage investments in innovative, high-tech companies. In its first year of operation, seven of the 16 selected venture capital funds invested €16.7 million in 25 young companies.

- BEST, the **Business Environment Simplification** Task Force, addresses barriers to competitiveness common to all Europe's 18.5 million SMEs. In response to BEST's recommendations, in 1998 the Commission published its Communication *Promoting Entrepreneurship and Competitiveness*, setting out an action plan which focuses on education, training and the workplace environment, access to finance and support for innovation, and the improvement of public administration.

- Finally, the Commission launched the **Trend Chart on Innovation**<sup>(6)</sup>, which is designed to help match future European Union innovation policy more closely to the innovative needs of the Member States and their respective innovation communities. Detailed information on nearly 200 national measures has been assembled for comparative analysis.

## Research in the regions

Transnational links between companies, universities and research centres which collaborate in EU research, combined

with research fellowships and research networks, have helped to establish a single European research area. By facilitating access to the best available skills and know-how, this benefits Europe as a whole.

But EU research is also narrowing the gap between the most and the least research-intensive regions in Europe. While less-favoured regions account for only 7% of the European Union's research expenditure, their research teams represented nearly 15% of FP4 participations in 1998, and took part in 40% of all projects.

The report notes the contribution of the European Regional Development Fund (ERDF), which has increasingly been used to support research especially in less-favoured regions, and of the Innovation programme's network

of Regional Innovation and Technology Transfer Strategies (RITTS) projects<sup>(7)</sup>.

(1) See 'Gathering Momentum – Innovation in Europe', edition 4/99.

(2) See 'Role Models for an Innovative Europe', edition 1/99.

(3) See 'A Virtuous Circle', edition 4/99.

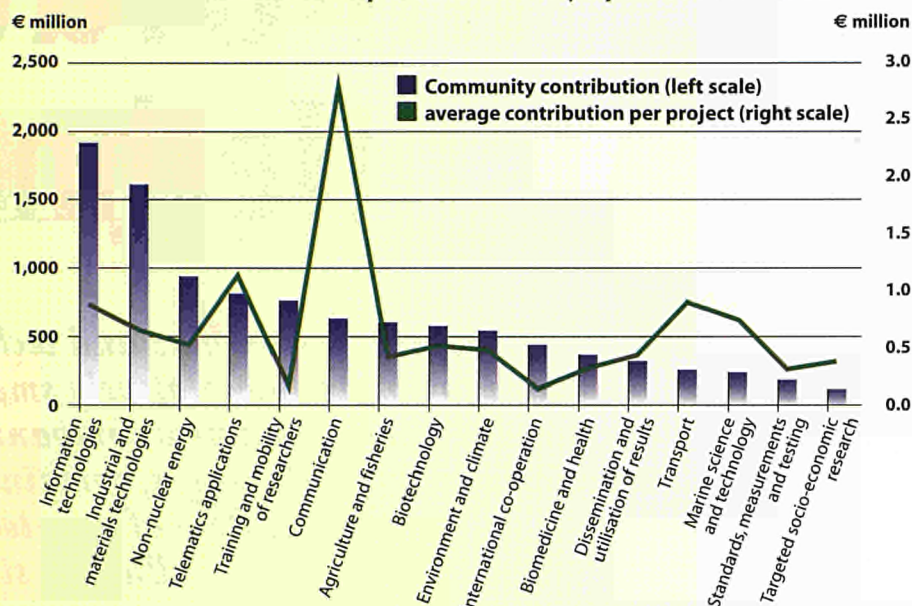
(4) See 'A Personal Service', edition 3/99.

(5) See 'Deep Pockets, Lengthening Arms', edition 3/99.

(6) See 'Benchmarking Innovation in Europe', edition 3/99.

(7) See 'Two Sides of the Coin', edition 4/99.

Figure 2: Fourth Research Framework Programme – Community contribution, by research area



By the end of 1998, a total of €11.2 billion had been contributed to shared-cost research projects under FP4. On average, the EU contributed €0.7 million per project, around 50% of total costs.

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• The full report can be downloaded from:  
<http://europa.eu.int/comm/dg12/report99.html>



# Innovation = (Technology +



*European researchers and technologists still find it hard to obtain the relatively small amounts of money needed to establish new companies. Access to finance, especially in the early stages, remains a serious bottleneck in the flow of new technologies to market. But the situation is improving.*

“ *I-TEC has lowered the threshold for early-stage venture capital investment in technologically innovative companies.* ”

**R**apid and continuous technological innovation is today critical to competitiveness in every industry. New technology-based companies play a key role in converting the results of academic and industrial research into innovative products and processes. Those which succeed grow quickly, and therefore constitute the primary source of new employment.

Of course, not all do succeed. Starting a new high-tech company exposes both founders and financial backers to risk. In the past, American entrepreneurs and investors have been more ready to accept these risks than their European counterparts. But although problems still remain, Europe is now catching up.

## Security blanket

Inventors are reluctant to leave secure positions to establish their own companies – in part because they know how hard it will be to attract the investment needed to grow the business. Banks and venture capital funds, on the other hand, are unwilling to develop their capacity to assess and manage high-risk investments – in part because they find too few opportunities to invest in exploitable new technologies supported by competent management teams.

But a turnaround is beginning. Success breeds success, and each spectacular high-tech stock market flotation encourages more entrepreneurs and venture capitalists to follow the same path – and helps to create a self-sustaining European culture of innovation.

## 1. Risk and Reward

*An integrated capital market, from seed funding to stock market, is the key to accelerated European innovation.*

In the past two years<sup>(1)</sup>, the risk capital available in Europe has increased rapidly. The European stock markets for high-growth companies created in the mid-1990s – Euro.NM, Easdaq and AIM – are still dwarfed by Nasdaq in the US, whose total capitalisation is more than 30 times greater. But with over 600 companies quoted, these markets now offer the means for venture capital funds to realise a return on their investments in new companies, once these are firmly established.

Venture capital funds invest private equity to finance the launch, early development and expansion of unquoted companies. The total amounts invested in Europe have risen sharply, reaching €7 billion in 1998. Though this falls far short of the €12 billion invested in the US, Europe is starting to close the gap.

Focusing on young companies with high growth potential, fund managers look for spectacular returns from every investment made, in the knowledge that eight out of ten

(1) For an earlier report on the status of the European risk capital market, see the dossier article 'Financing Innovation in Europe', edition 6/97.

(2) The text of the Action Plan is available at [http://europa.eu.int/comm/dg02/document/misc/risk\\_cap\\_en.htm](http://europa.eu.int/comm/dg02/document/misc/risk_cap_en.htm)

(3) COM(98)625, available from Internal Market DG website at <http://europa.eu.int/comm/dg15>



# People) + Capital

will fail to perform. But the proportion of venture capital invested in early-stage projects – that is, in companies which have yet to generate substantial revenue streams – also remains much lower in Europe than in the US (Figure 1), as does the proportion invested in high-tech sectors.

Nor is the situation uniform throughout Europe. The United Kingdom has the best-developed venture capital industry, while investment in early-stage projects is greatest in Germany and the Netherlands (Figure 2).

## Angel faces

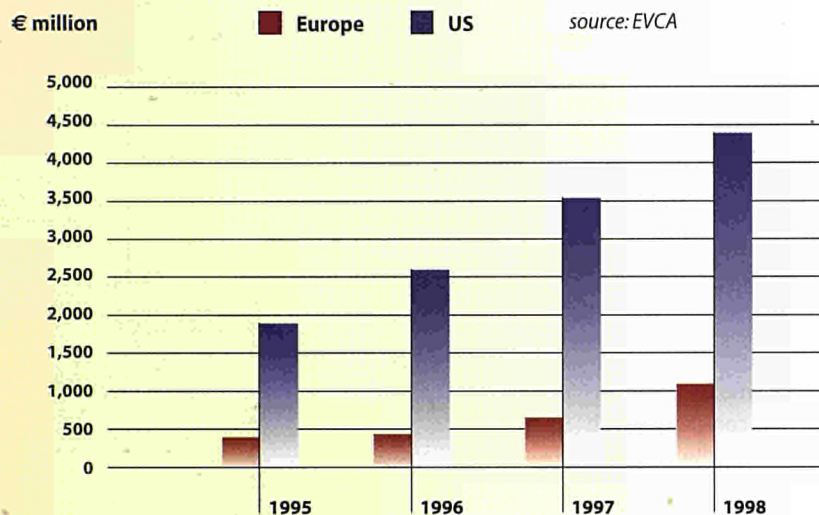
Venture capital funds need to make investments of at least €0.75 million to justify the costs of assessing a business project's technology, market and management team, and of monitoring its progress.

Much smaller amounts, of up to €0.25 million, are most readily available from 'business angels'. These are wealthy individuals, often successful entrepreneurs themselves, who invest both money and time in very early-stage companies – frequently acting as mentors to young management teams. They invest in businesses they understand well, and nurture them through hands-on involvement. Here, too, there is wide regional variation, with the greatest activity in the Netherlands, Finland and the UK, where business angels invest €750 million each year.

Entrepreneurs without a business angel and not yet ready to approach a venture capital fund must rely on personal or family savings and loans, since banks rarely lend to companies until their revenues are sufficient to cover interest payments. As yet, local or institutional seed funds providing the very small sums needed to develop a business plan and form a new company only operate successfully in a few isolated cases.

"Dynamic innovation demands that every link of the financing chain, from seed capital to stock market, is strong," says Jean-Noël Durvy of the Innovation Directorate. "At present, each remains weaker in Europe than in the US."

Figure 1: Early-stage investments, EU vs. US, 1995-98



*As a proportion of US early-stage investment, European investment of the same kind nearly doubled between 1995 and 1998. Nevertheless, the gap is still considerable.*

## 2. Cutting the Cost of Capital

*Current trends are positive, Jean-Noël Durvy believes, but Europe needs to do more to strengthen its innovation financing capacity.*

"Fiscal regulations, institutional traditions and the development of the venture capital industry vary widely, so this effort is principally required at national level," he says. "In particular, tax laws should not constitute a barrier to the formation or deployment of risk capital. Our job, at European Union level, is to establish the right direction, testing new approaches, and networking policy-makers and investors in order to spread good practice."

### New capacity

The development of a comprehensive risk capital market is a high priority for the European Council of Ministers. In April 1998, the European Commission launched a

Risk Capital Action Plan<sup>(2)</sup> defining action to be taken at EU and national level, while a parallel Action Plan for a Single Market in Financial Services<sup>(3)</sup>, adopted in June 1999, incorporates further measures to reduce the cost of capital.

"Community initiatives such as the European Investment Bank and the European Investment Fund have played an important part in mobilising private capital," says Marc Verlinden of the Innovation and SMEs programme. "The role of the I-TEC pilot scheme has been to increase the proportion of that capital directed to early-stage and high-technology projects, by strengthening the capacity of venture capital funds to appraise these investment opportunities."



## CASE STUDY

# The Innovator's Tale



*The European Commission's I-TEC pilot scheme lowers the threshold for early-stage venture capital investment in high-tech companies.*

"In Silicon Valley you can get financial backing on the basis of a good idea," says Paddy Falls, Managing Director of iOra, a British IT start-up with innovative products and ambitious growth targets. "That is still almost impossible in Europe. There is plenty of venture capital money around, but very little of it goes to the early stage."

## Entrepreneurial experience

As the first employees of an earlier start-up company which had been sold to the American multi-national Novell, Falls and his three co-founders had first-hand experience of the process of building a successful business.

"That gave us the confidence to leave our secure, well-paid jobs to create iOra in 1997," Falls says. "We were also able to put up our own money. But developing a world-competitive product takes at least €1.5 million."

In 1998, with a business plan and a working product prototype, they exchanged 20% of the company's equity for an investment of €300,000 by a syndicate of business angels – themselves successful IT entrepreneurs. "What we were looking for was 'investment plus,'" Falls explains. "We needed managerial, sales and marketing skills to balance our own technical expertise. We chose individuals who were willing to contribute time as well as money, and to advise us on a day-to-day basis."

The senior managerial experience which the business angels brought to iOra gave it the necessary credibility to raise larger amounts from venture capital funds.

"Networking, and personal recommendations, are the keys which unlock venture capital," says Falls. "The fact that senior industry figures were involved, and were risking their own money on the company, clearly gave MTI Partners confidence. But we talked to them for over a year before we signed a deal."



*Soft CD, which uses iOra's patented Epsilon replication technology, makes possible the regular updating via the Internet of information stored on CD – such as product catalogues and technical support manuals.*

## Risk capital

One of 28 European venture capital funds participating in the I-TEC network, MTI Partners specialises in providing early-stage risk capital to British high-technology companies. "The vast majority of the fund managers we approached were looking for an existing revenue stream. That was something we did not have at the time," Falls admits.

Not only was MTI willing to invest in the pre-revenue phase, but it also invested nearly four times as much as any other fund offered – €3 million. "We could have raised €750,000 fairly easily," Falls says. "But that would only have been enough to keep us going for about six months. I would have spent the whole time trying to raise more money."

MTI's investment and management resources – the fund supplies a part-time financial controller – have allowed Falls and his colleagues to concentrate on what they do best, building great products.

"Some entrepreneurs worry about their investors looking over their shoulders," he says. "We see their involvement as a real bonus. We all want to build a successful company, and to exit in between three and seven years from now, either through a trade sale or a stock market flotation, with a return that is a large multiple of our original investment."

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The 28 funds currently participating in I-TEC (Innovation and Technology Equity Capital) manage a total of €1.3 billion – of which €0.5 billion is earmarked for technologically innovative companies less than three years old. To date, they have made 115 investments, worth €95 million, primarily in start-up companies in the information technology and biotech sectors – leading to the creation of over 1,500 high-quality new jobs.

“Most have used I-TEC support to buy in expertise for technology appraisal, or to recruit specialist fund managers,” Verlinden explains. “I-TEC has enabled new fund management teams to enter the early-stage technology market by lowering the threshold for this type of investment.”

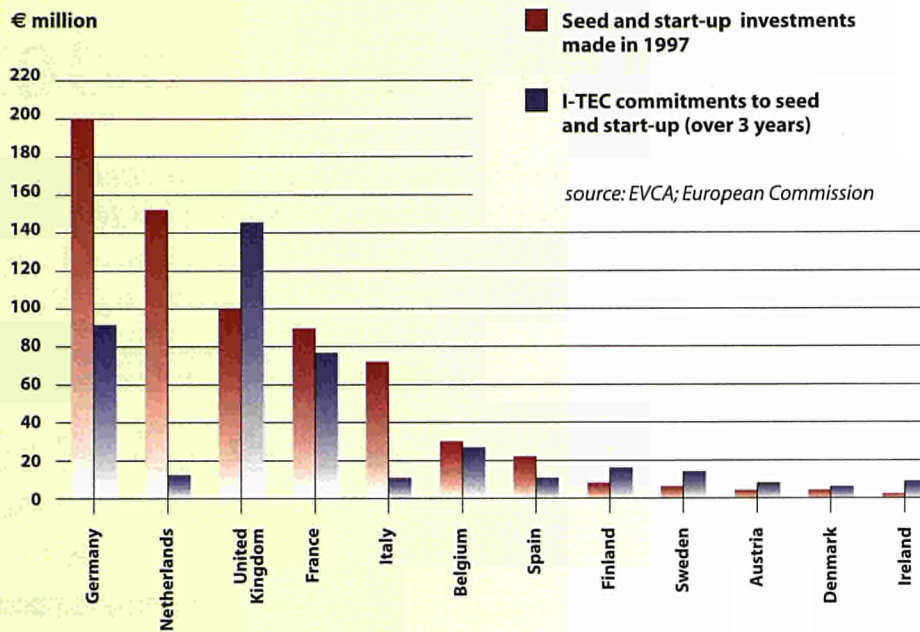
### In good company

Neither private equity nor exploitable research results are sufficient to ensure the commercialisation of new technologies – the vehicle for the successful marriage of capital and technology is the entrepreneurial company.

“The rate of high-tech company formation is determined at the micro-level by the availability of suitable managerial and entrepreneurial skills, as well as technical ones,” says Verlinden. “At the macro-level, taxation, the administrative complexity of company creation and the terms of researchers’ employment contracts are all critical factors. It is impossible to tackle innovation financing in isolation from such issues.”

The LIFT service<sup>(4)</sup>, launched in May, provides entrepreneurs with practical first-line support in preparing business plans and presenting them to potential investors. At the level of institutions and governments, the Trend Chart on Innovation<sup>(5)</sup> is for the first time monitoring the impact of public policy measures designed to foster innovation financing. Meanwhile, the FIT policy exchange project is supporting a series of workshops bringing together research centres, business incubators and investors to address topics such as guarantee mechanisms, technology rating and the role of micro-financing in research spin-offs.

**Figure 2: 1997 seed and start-up investment, and I-TEC commitments, by Member State**



source: EVCA; European Commission

*The funds participating in the I-TEC pilot scheme represent a sizeable proportion of total European venture capital capacity directed to early-stage technology investments.*

## 3. Stimulating the Flow

*As risk capital becomes more readily available, the challenge is to get it from venture capital funds into companies.*

“The bottleneck has shifted, and in the next few years we will focus more on deal flow,” says Verlinden. This means improving the entrepreneurial skills technology-based firms need to develop bankable business plans, and promoting closer links between investors and research and technology centres.

One FIT exercise is examining the entrepreneurship training curricula of European universities. “We want to get venture capitalists more closely involved, to ensure that courses meet the real needs of investors and entrepreneurs,” Verlinden explains.

### Technology-friendly

On the supply side, I-TEC is already developing appraisal capacity among venture capital funds. But as Trevor Clifton of UK consultancy and seed financier The Generics Group explains, there is also a shortage of such capacity among banks. “Only 1% of their business lending is to new technology-based firms,” he says. “Since the returns on debt finance are relatively modest, the key issue is bringing the cost of due diligence right down.”

Generics recently conducted a study of European debt financing for innovation on behalf of the Innovation and SMEs programme. It did not reveal a major change in the banks’ attitudes to young high-tech companies, though the situation may be easing slightly as the equity supply increases and they forget about their problems with non-performing loans in the late 1980s. “Banks once again want to be seen as the friends of the entrepreneur, though it is not yet certain that this is more than a public relations exercise,” says Clifton.

Among the most promising developments, he says, is the growing willingness of some venture capital funds to adopt a more hands-on approach to young technology-based companies.

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(4) See this edition, page 19.

(5) See ‘Benchmarking Innovation in Europe’, edition 3/99.



## CASE STUDY

# The Investor's Tale

*From investment proposal to deal to market leadership to trade sale – all in under six months. This is venture capital, Internet-style.*

Europe's Internet services sector, although much smaller than America's, is now experiencing similar explosive growth. It is not venture capital which is in short supply, but high-quality business plans – competition between funds for the chance to invest in good ideas, supported by competent management teams, is intense.

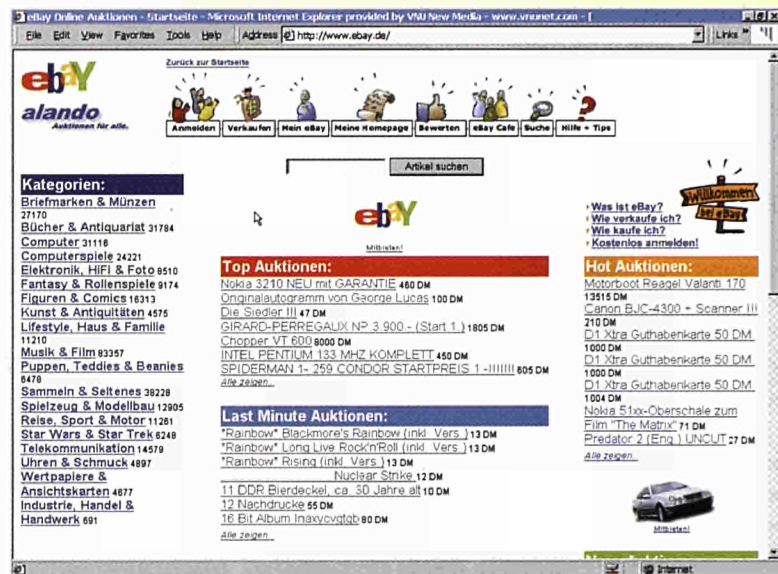
"Europe cannot afford not to be a part of the revolution in information-based services," says Frank Böhnke of the German I-TEC member, Wellington Partners, a venture fund which, for the past two years, has focused exclusively on start-up Internet companies. "Funds like Wellington do more than provide capital for young European entrepreneurs. Our role is also to find them, to pass on our experience of building Internet brands, and to use our networks to help them develop strategic partnerships."

## Understanding the model

In early February 1999, Wellington was approached with a proposal for a German consumer-to-consumer on-line auction service, closely modelled on the successful US company eBay, which enables individuals to trade anything from cars to computers, and from antiques to animals.

"The six-man team had spent time in Silicon Valley, had studied eBay in detail, and knew how to adapt the business model to the German market," says Böhnke. "They came with excellent references and, although they lacked business experience, we were impressed by their level of commitment, knowledge and energy."

Several funds were interested but, as Internet specialists, Wellington already understood the concept and the technology, as well as the market. "We were able to skip across the familiarisation stage and move straight to negotiations," Böhnke says. "We both knew precisely what we wanted to achieve."



*Having established Alando as Germany's leading consumer-to-consumer on-line trading company, its owners accepted acquisition by the US market leader, eBay, and are now extending the service across the EU.*

## Adding value

The deal they signed with Alando on 20 February was for just under €3 million. The package also involved a strategic partner and a number of business angels. "We invested in a business model, and founded the company jointly with the entrepreneurs," Böhnke explains. "We sketched out a plan, put together the financing, and identified a technology supplier with suitable software that was ready to roll."

Alando's service was launched on 1 March, and proved an immediate success. By May, it had become the German market leader, and the management team was in discussion with eBay about a possible acquisition. This was concluded on 22 June, forging a strategic alliance which equipped Alando for further rapid growth, rolling out its service across Europe as eBay's European division.

"Wellington's experience and network contacts had added considerable value to Alando. At the rate the company was growing, it could perhaps have stayed indepen-

dent for another six months and achieved a higher price," Böhnke reflects. "But the management team wanted the deal, which has certainly given us a fantastic return on our original investment."

Venture capital's unique ability to create such entrepreneurial opportunities remains the key to Europe's participation in the continuing Internet boom.

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# Virtual Prototyping

*Until now, product designers have reconciled incompatible demands – for lightness and strength, for example – by making sub-optimal trade-offs. A new virtual prototyping tool allows them to weigh multiple design parameters simultaneously, shortening the development cycle and improving final product quality.*

**C**omputer Aided Engineering (CAE) has in recent years become an indispensable part of the product development process across the whole of manufacturing industry. In many applications, however, the problem remains that several different disciplines are involved. The optimisation of a product's vibro-acoustic performance, for example, may lead in a different direction from the optimisation of its thermal behaviour, while manufacturability requires a third solution.

"Traditionally, designers simply fight out a compromise, often on the basis of limited evidence about the likely results," observes Nikolas Tzannetakis of Belgian engineering software and services company, LMS International.

## Transfer and retransfer

Tzannetakis co-ordinated an Innovation project, Spinosa<sup>(1)</sup>, which has transferred to the field of mechanical CAE a novel software technology capable of driving multiple existing simulation tools in order to find an optimal design. Created by the Belgian microelectronics research centre, IMEC, as an aid to the rapid development of new integrated circuits, the system uses advanced design of experiment (DOE) and response surface mo-

delling (RSM) methods to generate a wide range of possible designs and test the performance of each.

In the course of the project, manufacturers in four different sectors – including Electrolux Zanussi SpA in Italy and Thomson Television in France – tried out LMS' Optimus product, which is now on the market. Fifty copies have already been sold, half of them to automotive manufacturers and suppliers. In fact, the Innovation project has introduced such valuable enhance-

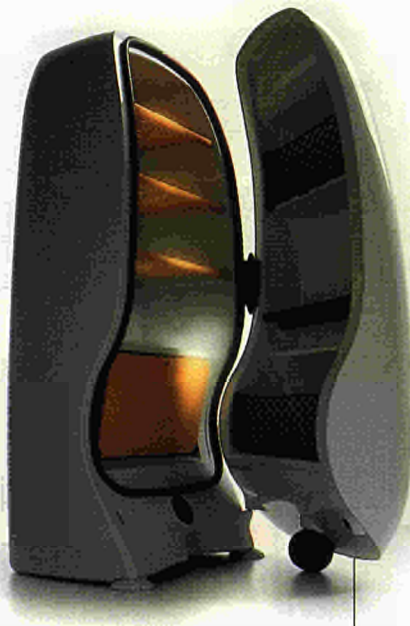
ments that Optimus is now being sold in significant quantities in the microelectronics industry itself, from which the underlying technology originally emerged.

## Time to market

"Our interest in the IMEC technology stemmed from our work on vibro-acoustic simulation tools," says Tzannetakis. "At the start of the project we had no idea that it would also find applications in other areas. One of the end-users, the Italian automotive design consultancy Engin Soft, was employing the system for vibro-acoustic applications, but very soon started to use it to study fluid dynamics and casting solidification problems too."

LMS and IMEC, which jointly undertook the adaptation of the original software, realised that there was almost no limit to the range of design fields in which it could be applied. "Its real power comes from its ability to span multiple disciplines," Tzannetakis explains. "You can take any number of different design parameters into account at the same time. That is very new, and extremely valuable, dramatically reducing time to market."

Optimus does not replace manufacturers' existing CAE simulation tools, but extracts greater value from these assets by ●●●



*Optimus helped Zanussi to design the Oz refrigerator, which combines dramatic styling with greatly improved performance.*

Innovation

## The Innovation/SMEs Programme In Brief

Part of the EU's Fifth Research Framework Programme, the 'Innovation and participation of SMEs' programme promotes innovation and encourages the participation of small and medium-sized enterprises (SMEs) in the framework programme. The Programme Director is Mr G.C. Grata (Innovation Directorate, Enterprise DG).

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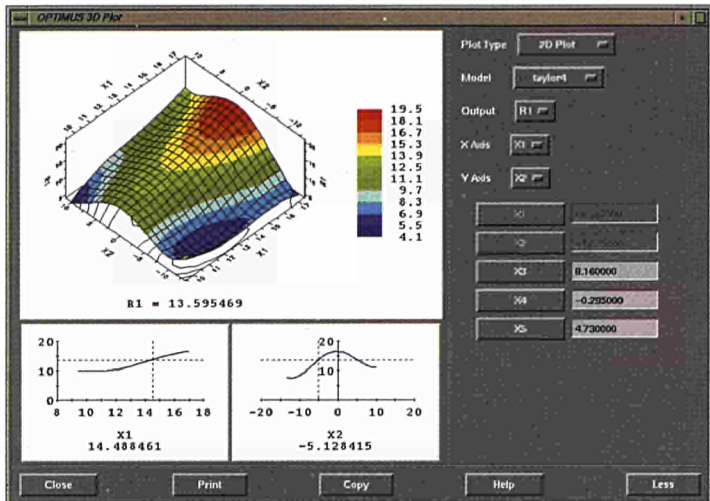
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(1) Project IN10231I – Software package implementing novel optimisation strategies applied to high-tech products.





A high-quality graphical user interface is a key attraction of the Optimus package. Here, a response surface model (RSM) is displayed.

providing automated links between them. Engineers can choose from a wide range of optimisation algorithms. The software then generates input files for each simulation program, extracts the necessary data from their output files, and produces readily understandable graphical presentations indicating the relative effect of each design parameter on each aspect of performance.

### Innovative solutions

Is it really possible to relieve designers of time-consuming 'manual' tasks, and free them to apply their creativity? The experience of Spinosa's four end-users suggests that it is. "They carefully documented their use of Optimus in their everyday work," Tzannetakis explains. "In one case, design time was reduced from six weeks to one week, with a simul-

taneous improvement in product performance." The system also helped Zanussi to produce the Oz refrigerator – a revolutionary design in which an 80% improvement in temperature uniformity within the cabinet was achieved through a radically different placement of the condenser.

The technology can speed the optimisation not only of products, but also of manufacturing processes. Manufacturing efficiency has a critical impact on cost, especially where production volumes are very high, and Optimus has already demonstrated its ability to streamline production in the microelectronics and plastic moulding industries.

LMS and IMEC, based less than two kilometres apart, have a

longstanding collaborative relationship. In Spinosa, they created a unique engineering aid, with IMEC refining its optimisation methodologies, while LMS developed the necessary protocols for linking it to mechanical CAE tools, and a powerful graphical user interface.

Now LMS is actively marketing the product through its own world-wide distribution network, under a formal five-year agreement for the transfer to IMEC of royalties on the underlying intellectual property rights. But the two partners will continue to work together to extend the range of industrial process to which their virtual prototyping approach can be successfully applied.

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## Finnish Presidency Web Service

To coincide with the Finnish Presidency of the Council of the European Union, which runs from 1 July to 31 December 1999, CORDIS is hosting a new web service, developed in collaboration with the Finnish Ministry of Trade and Industry and the Finnish Technology Development Centre (TEKES), which hosts the Innovation Relay Centre Finland.

The service includes coverage of research and innovation activities discussed by the Council during Finland's presidential term. It also highlights Finnish national research and innovation schemes and projects.

"During the past few years there has been a concerted effort in Finland to invest in the development of the whole innovation system," says Minister of Trade and Industry Erkki Tuomioja, in an interview published on the web pages. Participation in the framework programme proved to be an important element of Finland's own progress towards membership of the EU, and he is keen to offer the same opportunity to today's applicant countries.

**The Finnish Presidency web site is at:**  
<http://www.cordis.lu/finland/en/home.html>



# Wasting Away



*Polluted water from the paper and pulp industries seriously damages rivers and streams – and is subject to ever tighter emission controls. But, thanks to an Innovation project, a low-cost, environmentally-friendly solution based on evaporation is now available.*

**C**leaning up the effluents from paper and pulp manufacture is usually done by biological treatment. But the residual water still contains some organic chloride compounds, endangering water courses, threatening wildlife near points of discharge, and falling far short of drinking water standards. The process also produces large amounts of sludge. Some is suitable for agricultural use, but the remainder must be disposed of in landfill or building construction sites.

An alternative is to eschew chlorine in paper bleaching, but this produces paper of lower quality and increases production costs.

"What the industry wants is to close the loop by recycling its wastewater," says Leif Ramm-Schmidt of Hadwaco Ltd Oy, a Finnish manufacturer of heat exchangers, which leads the Innovation project<sup>(1)</sup>.

The principal new technologies with the potential to achieve this goal are membrane filtration and evaporation. But membrane filters have difficulties with fouling, while evaporation has high operational and capital costs due to corrosion of the metallic heat transfer surfaces, which necessitate the use of expensive specialised materials.

## Polymer films

Hadwaco, together with Finnish forest industry consultant Jaakko Poyry Oy and Eka Chemicals of Sweden, a supplier of

chemicals to the paper industry, have been collaborating since 1994 to develop an improved evaporation technology. An industrial-scale pilot unit installed to evaporate bleaching plant effluents at Stora Paperboard's mill produced promising initial results, but technical problems remained.

Now, Hadwaco and Stora have overcome these problems with the help of Helsinki University of Technology's polymer technology department and two other Finnish companies – Chemitech Consulting and Ab Rani Plast, a manufacturer of advanced polymeric films. Also involved are Spanish polymer developers Dow Chemical Iberica and Nalco Europe of the Netherlands, a supplier of anti-scaling chemicals.

The key to the new evaporation technology is the use of polymer films as heat exchange surfaces in place of metals. "Imagine a big pot in which you are boiling water until it evaporates, but where the heat transfer surface – the bottom of the pot – is made of polymers instead of metal," says Ramm-Schmidt.

## Closing the loop

"The heat exchanger inside the evaporator is constructed of thin film plastic bags, heat-sealed to form channels," he explains. "The construction is inflated through the slightly higher pressure inside the bag. The waste water is evenly distributed on the outer surface, where it is brought to boiling by the heat of the con-



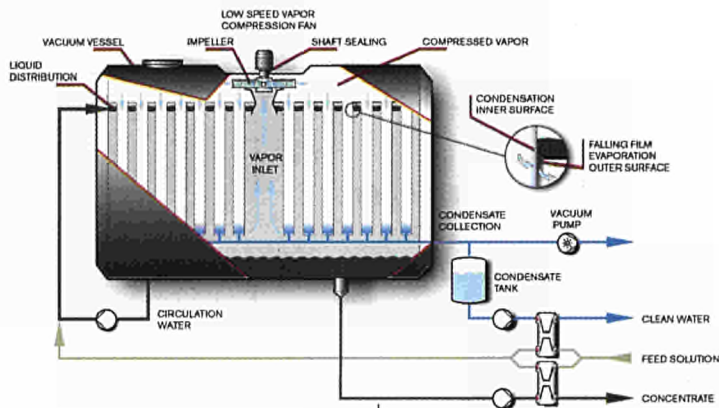
*Hadwaco's industrial-scale development and demonstration evaporator unit in operation at Stora Paperboard's Gruvön pulp mill in Sweden.*

densing vapour inside the bag. A mechanical vapour compressor circulates the vapour and keeps the process running without any other external heat sources. The very clean condensate is collected for recycling back to the process. The solids concentrate into a very small volume, which can be disposed of more easily, for example by incineration or for new industrial use."

The system operates under vacuum at a boiling temperature of just 60°C, well below that at which the polymers would be damaged.

Developed for the wood and pulp industries, the process has a number of other potential applications. It can extract wastes from water in the chemical and food industries and in metal surface treatment, clean landfill leachate waters and serve ●●●





Schematic diagram, showing the operating principle of the innovative evaporator.

as an alternative to conventional desalination, producing drinking water from sea water or polluted sources.

"The water produced is very clean indeed," says Ramm-Schmidt. "The separation of salts and other non-volatile substances is practically 100%. Separation of volatile compounds such as alcohols or organic acids is not quite so good, but these can be collected in a small volume of condensate for further purification in a separate process."

### Cost-cutting

The technology offers pulp and paper producers a double advantage, greatly reducing environmental impacts while minimising fresh water costs. Capital costs should soon rival those of membrane systems while producing water of greatly superior quality, and running costs are lower than those of traditional evaporation systems.

Since the water only needs to be heated by 7 or 8°C, electrical

power use is just 8-9 kWh/m<sup>3</sup> of clean water – less than one-third that of traditional evaporators employing vapour compression. In cases where low-cost thermal power is available, electrical power use can fall below 2 kWh/m<sup>3</sup>.

The partners have applied for three patents to protect the novel features of the new wastewater processing system – and as a source of future licensing income. The first, approved in Finland and pending elsewhere, is for an improved condensate collection device. The other applications cover a new low-cost, high-capacity heat exchange element and an improved liquid distribution system for the heat exchangers.

### Cleaner disposal

The industrial-scale demonstration and development unit has been running at Stora since 1994, but research continues on related improvements. Priorities include the further refinement of concentrated wastes disposal methods. A low-cost incinerator of liquid wastes is being developed by Conox, an associate of Hadwaco's parent company Hackman Oyj. This operates under high pressure, using oxygen instead of air. Emissions are smoke-free, with only carbon dioxide being released, and the level of heat recovery is high.

In the face of increasingly stringent legislative control of wastewater quality, a clean solution to the problem of effluent treatment is a high industrial priority. Now, the Innovation project has demonstrated that the low-cost evaporator is the best available technology for the management of effluents, and has brought it to the point of commercial viability.

Systems are already installed and operating in 15 locations around the world, and there is particular interest in the technology in China and Indonesia. Over the next ten years, it has an estimated global sales potential of several billion euros. The project's success will benefit not only its partners but also a number of other small and medium-sized enterprises – Hadwaco's component and service suppliers for the construction of the evaporators.

Transnational collaboration has been crucial in bringing the technology to market. As Ramm-Schmidt says: "Without the Innovation project, it would have taken us considerably longer, and the results would probably not have been so good."

(1) Project IN104101 – Bleach plant effluent treatment via a low-cost evaporator.

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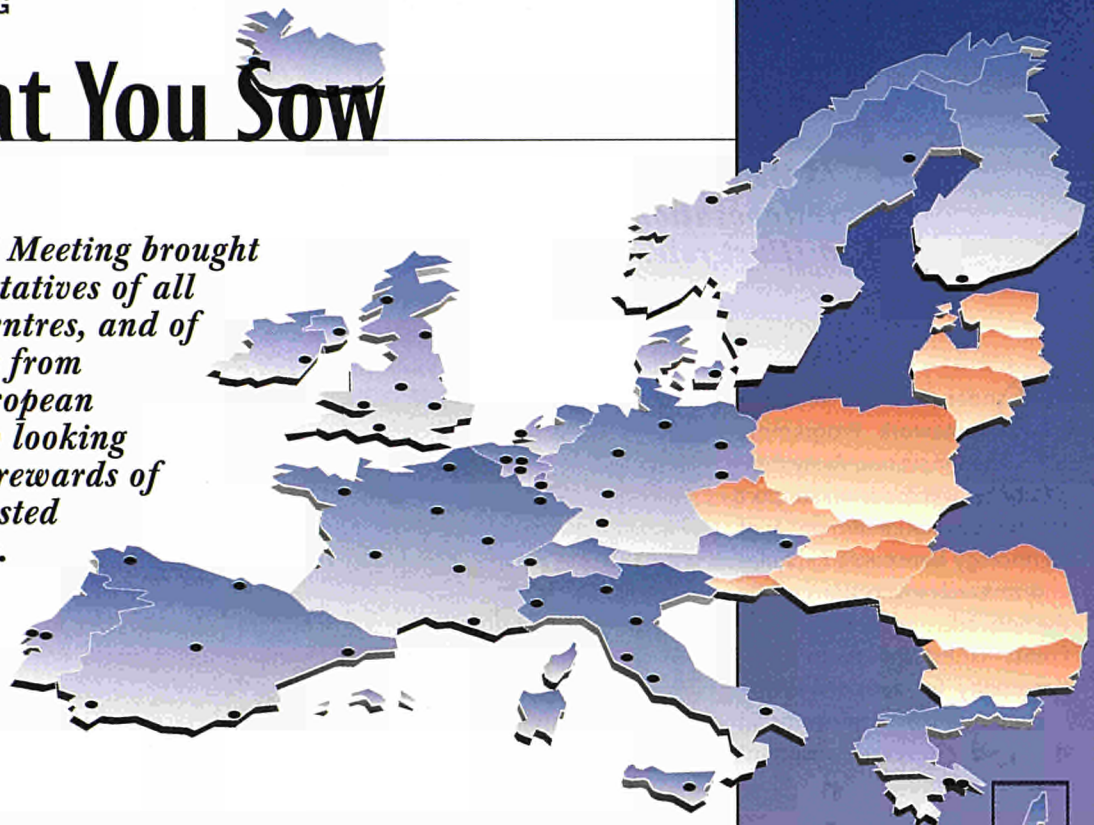
# Innovation Relay Centre

N e w s l e t t e r

ANNUAL MEETING

## Reap What You Sow

*The fourth IRC Annual Meeting brought together senior representatives of all 53 Innovation Relay Centres, and of the ten Fellow Members from central and eastern European countries. They are now looking forward to reaping the rewards of the time and effort invested in building the network.*



**I**n the Fifth Research Framework Programme the IRC network will focus its efforts even more intensively on supporting the creation and development of transnational technology partnerships. The annual meeting, held in Prague in June 1999, provided an opportunity to review the network's achievements to date in the light of this new role.

"The original mission was to provide regional assistance to companies, designed to help them reach technology transfer deals with counterparts in other European countries. In order to realise this vision, we have created an entirely new profession," says Javier Hernández-Ros. "The two days of high-quality presentations and lively exchanges of ideas provided a heartening reminder that together we are now operating an effective European technology transfer infrastructure."

The meeting examined a range of options for the further development of the network's professional skills and tools – required by the more in-depth technology

transfer support service which the IRCs will offer in the period 2000-2004. It also opened the debate on the possibility of charging for certain specialist services in the future, as a means of securing a contribution from end-users to IRC running costs.

### Five-year plan

The meeting took place just before the launch of a new call for tenders to operate the IRC service after the current contracts finish at the end of March. "As far as we know, most of the current contractors plan to tender for the next phase – and we used the meeting to look ahead to another five years of working together," says Hernández-Ros.

"Our choice of Prague as the venue signalled our commitment to working closely with our colleagues in central and eastern Europe as the Community research programmes are opened to their countries. The very high standard of the meeting's organisation by the Czech FEMIRC amply demonstrated the quality of their contribution to the network."

Specific issues addressed at the meeting included IRC involvement in schemes to provide innovative companies with improved access to capital<sup>(1)</sup>, and collaboration between the IRCs and other European networks<sup>(2)</sup>.

(1) See this edition, page 19.

(2) See this edition, page 16.

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## The IRC Network in Brief

The Innovation and SMEs Programme's network of 53 Innovation Relay Centres (IRCs) spans the EU, Iceland, Norway, Switzerland<sup>(1)</sup> and Israel (see map), with 'twinning' arrangements extending it to some central and eastern European countries (shaded in red).

Each IRC is its region's window on European innovation, helping companies and research organisations transfer technologies to and from the rest of Europe. Further information about the IRC network is available on the IRC homepage (<http://www.cordis.lu/irc/home.html>).

(1) Associate Member





# A Network of Networks

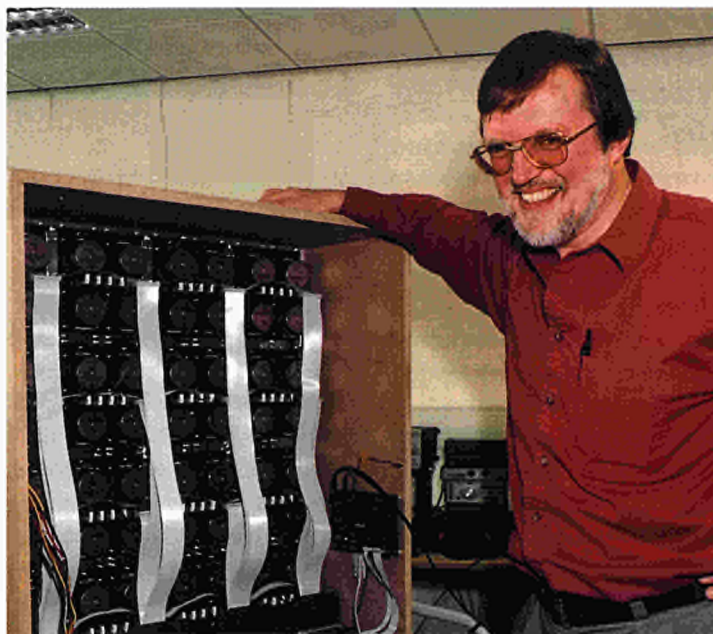
*A number of different European networks offer a range of innovation-related services for small and medium-sized enterprises (SMEs). Efficient delivery of these services demands improved collaboration, based on a clear understanding of each network's distinct role.*

**U**nder the Fifth Research Framework Programme (FP5), the Innovation Relay Centres (IRCs) will focus on support for the transnational transfer of technology between companies and research institutions, while the networks of National Contact Points (NCPs) will assume responsibility for supporting the participation of companies in the specific research programmes<sup>(1)</sup>.

This new division of labour has prompted detailed consideration of opportunities and mechanisms for improved collaboration, not just with the NCPs but with other networks of innovation and SME support agencies, such as the Business and Innovation Centres (BICs) and Euro-Info Centres (EICs).

"The bottom line is that a clear definition of each network's key tasks, and efficient signposting of clients between them, is essential for the delivery of a high-quality service," said Deputy Director-General Parajón Collada at the IRC Annual Meeting.

The potential for increased cooperation between IRCs and BICs is already being actively explored by the European Commission, in order to improve synergy between the two complementary networks. No one doubts the desirability of inter-network collaboration – of the IRC partner organisations which responded to a recent survey, 84% said that they were keen to establish or strengthen co-operation with the BIC in their area. The question is how best to achieve it.



*Dr Tony Hooley of '1...Limited' with a prototype of the company's digital loudspeaker. 1...Limited is a long-term BIC client which has recently used the IRC's partner search service to identify prospective transnational collaborators.*

## Transnational dimension

BICs were established to support regional economic development by providing local companies with practical assistance relating to a range of business processes. Innovation and the acquisition or development of new technology are covered, but so are business planning, training, marketing and exporting. "BICs are funded primarily as regional agencies, and their technology transfer support focuses on linking client firms with local academic research institutes," says Alex Smeets of St. John's Innovation Centre in Cambridge, United Kingdom, which hosts

both a BIC and the IRC Eastern England<sup>(2)</sup>. "The European BIC Network (EBN) provides a forum for the exchange of experience and good practice, but membership is voluntary, and does not form an integral part of the BIC mission."

IRCs, by contrast, although they serve very much the same client group, do so exclusively in the context of cross-border transfers of technology – joint research and co-development projects, as well as marketing and licensing agreements. IRC staff help local companies to identify potential transnational technology suppliers or users, and offer expert support during the often lengthy period of negotiation

leading up to a formal agreement. They rely heavily on close professional links with network colleagues around Europe, and on a purpose-built network infrastructure for the electronic exchange of technology offers and requests.

Having both agencies housed under one roof works well, says Smeets, who manages the IRC Eastern England. "The services are nicely complementary. BIC clients progress to the IRC when they are ready to take a technology into transnational markets. But we may also refer a company to the BIC when the technology it needs could be sourced closer to home. Both sets of clients gain access to a broader spectrum of services."

## Wide open spaces

While Eastern England has one of the highest concentrations of technology-based SMEs in Europe, in Northern Sweden firms are few in number, and separated by very large distances. But here too, although the BIC and IRC services are delivered by different organisations, close co-operation has been mutually advantageous, producing a more efficient overall service.

"We meet BIC staff regularly to plan our activities for the month ahead," says Paul Howgate of IRC Northern Sweden. "Neither of us has the resources to cover the region as well as we would wish, so it makes sense to share travelling costs by representing one another."





Network	Client group	Services	Coverage	Web address
<b>IRC</b> (Innovation Relay Centres)	Technology suppliers and technology users, principally SMEs	Support for transnational technology transfer (technology acquisition, licensing, etc.), first-line advice on IPR and innovation financing issues	53 IRCs, plus regional offices, in every EU Member State, Iceland, Norway, Switzerland and Israel, as well as some central and eastern European countries	<a href="http://www.cordis.lu/irc">http://www.cordis.lu/irc</a>
<b>NCP</b> (National Contact Points)	SMEs, large companies, research institutions and universities wishing to participate in EU research	Pro-active information dissemination about EU research programmes, and support for the development of research project proposals	In each Member State and Associated State, at least one NCP for each of FP5's seven thematic and horizontal programmes, including a special SME NCP	<a href="http://www.cordis.lu/fp5/src/ncps.htm">http://www.cordis.lu/fp5/src/ncps.htm</a> For SMEs: <a href="http://www.cordis.lu/sme/src/sme-ncps.htm">http://www.cordis.lu/sme/src/sme-ncps.htm</a>
<b>EIC</b> (Euro-Info Centres)	All SMEs	First-line information, advice and assistance on EU programmes, funds and legislation, training seminars and documentation	237 Euro-Info Centres and 41 Associate Members (AM) are available to SMEs in all the regions of the European Economic Area	<a href="http://europa.eu.int/en/comm/dg23/eic/eic.htm">http://europa.eu.int/en/comm/dg23/eic/eic.htm</a>
<b>BIC</b> (Business and Innovation Centres)	Technology-oriented SMEs	Support for business creation and development – including planning, networking, access to capital, business incubators	140 BICs throughout the EU	<a href="http://www.ebn.be/">http://www.ebn.be/</a>

The two agencies maintain distinct identities, but each is able to present the other's service package to a prospective client, alongside their own.

"Busy owner-managers find it helpful to be offered a complete menu of services in a single meeting," Howgate says. "Although they may not need the IRC's assistance immediately, we have found that this approach creates a positive impression which brings clients back to us when they do begin to think about transnational partnership."

### National Contact Points

Mechanisms for the efficient mutual referral of clients bet-

ween the IRC and NCP networks, as envisaged by the Innovation and SMEs programme, are also likely to vary widely from country to country.

Howgate is confident that in Northern Sweden, where the two host organisations have well-established links, cross-referral will work smoothly, for example. But in the UK, where the NCP for each programme maintains only national offices, Smeets hopes to secure regional funding which will enable IRC Eastern England to continue to fulfil its current role as first point of contact for potential participants in FP5, referring clients to the appropriate central NCP for more detailed advice and support. ●

(1) See 'Research – Only Half the Story', edition 2/99.

(2) See 'IRC Eastern England', edition 6/98.

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# Meeting Potential Customers Virtually

*Travelling to partnering events is time-consuming, and sometimes fails to produce a single useful contact – but staying away may result in an important opportunity being missed. Now a group of Innovation Relay Centres has shown that it is possible to meet new partners via a videoconference link-up.*

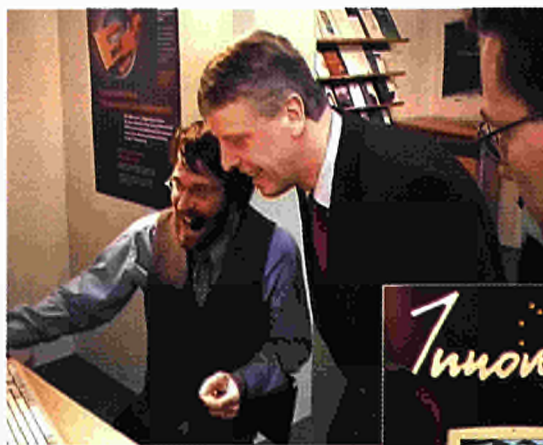
"It is not always easy for busy entrepreneurs to travel to transnational technology brokerage events of the kind organised by the IRCs," says Boris Adloff of IRC North Germany. "They would be happy to make the trip if they were sure of meeting a valuable new customer or supplier, but there is no way to guarantee that."

Adloff and colleagues from four other IRCs collaborated to test the feasibility of offering clients the chance to participate 'virtually', using modern videoconferencing equipment. Video links established using two or three parallel ISDN connections between the partnering event and one or more IRC offices would enable local companies to make presentations and conduct one-to-one meetings with prospective partners, without the expenditure of time and money required to attend in person.

## Useful contacts

They piloted the approach at an IRC technology transfer day staged in Hannover at the CeBIT99 information technology trade fair. Ten firms and research institutes participated via video link-up from Sweden, France, Finland and Latvia – some making product presentations, some discussing their technologies with IRC staff, and others meeting potential partners.

"Germany is the largest market in Europe for our Linux-based



*Videoconferencing enabled Finnish SMEs to do business at CeBIT99 from the office of their local Innovation Relay Centre.*

web business solutions, and we really wanted to find a German partner. But at the time we were just too busy to go to CeBIT in person," says Jari Ala-Ruona of Finnish company Netmill. "Videoconferencing allowed us to meet three university groups involved in data-mining, and to discuss the possibility of collaboration in a research project."

Heptagon Oy, a university spin-off company working in the area of micro-optics, is still discussing possible collaboration with one of the three potential partners it met. "Telecommunications is the fastest-growing application area for our technology, so we knew that there would be important potential customers among the companies exhibiting at CeBIT," says Managing Director Jyrki Saarinen.



## Facilitating participation

Both men are enthusiastic about the videoconference system, and would use it to attend other partnering events in future – although at first they found it strange.

Presentations were conducted as interviews, in order to maintain their 'live' quality. "But it was

slightly disorienting to make a presentation without being able to see the audience's response," warns Saarinen. "And you need to plan one-to-one meetings very carefully to get the most out of them – clearly, it is not possible to do things the way you would face-to-face." Ala-Ruona would like prospective partners to have access to a computer so that he can demonstrate Netmill's products on its website while he is talking to them via the video link.

Kirsi Tuominen of IRC Finland acknowledges that the system can be improved – in the noisy environment of a trade fair, cordless headsets with integral microphones would greatly improve sound quality, as well as improving the confidentiality of individual discussions, for example. "But the pilot clearly showed that videoconferencing can lower the threshold for SME participation in such events," she says. ●

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# What Every Start-Up Needs

*Lack of access to finance constitutes the primary barrier to innovation for many IRC clients, but few IRCs have the specialist skills to help companies in this area. LIFT offers expert assistance, but cannot provide continuous, hands-on support. Are the two services complementary?*

**L**IFT (Linking Innovation, Finance and Technology)<sup>(1)</sup>, launched in May, has already been welcomed by Innovation Relay Centres as easing a long-recognised bottleneck in the transnational spread of new technology – the difficulty, especially for start-up companies, of securing the financial backing they need from business angels, venture capital funds or banks<sup>(2)</sup>.

The service does not provide a brokerage service, but offers clients a practical information pack designed to help them take the first steps towards finding a suitable investor, together with up to four hours of individually tailored first-line expert advice, either face-to-face or via a telephone helpline.

"The information pack is proving to be extremely popular," says Marco Cecchini of the European Commission. "It is not just IRC clients who are finding it helpful. Several IRCs are now using the checklist 'Assessing Your Venture' in their own advisory work, as well as the guides to preparing a technology business plan and approaching a venture capitalist."

## Local partners

The LIFT Helpdesk is already assisting IRC clients – both indirectly, with general advice to IRC staff, and with direct help for companies when more specific support is needed.

"We are working with a group

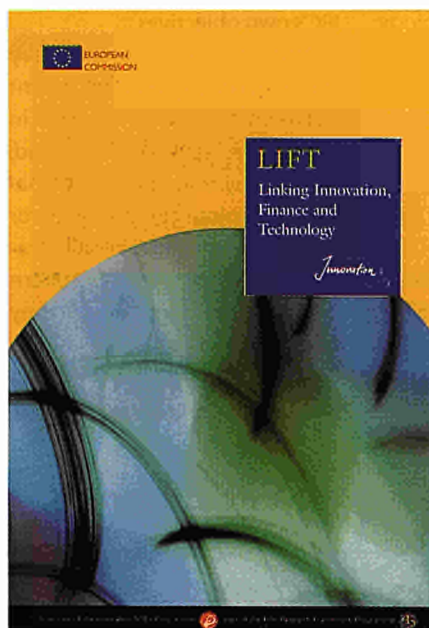
of entrepreneurs who want to create a new research-based company, but need private capital from outside the region as a component of their financing package," says Gilles Schlessler of IRC Luxembourg-Trier-Saarland. "The specialist tools and advice available from LIFT enabled us to guide the group rapidly through the steps they would need to take to find appropriate backing."

Angus Fraser, LIFT's general manager, is keen to establish reciprocal cooperative arrangements with IRCs. "Access to first-line specialist advice on financing allows IRCs to offer a more complete service," he says. "In return, the IRCs will promote our services to their clients."

In due course, he expects to develop closer relationships with IRCs which have recognised expertise in helping technology-based start-ups to prepare business plans. "In time, we want to build a network of local support for LIFT clients, so that if we detect a weakness in a specific area of their business plan we can refer them to a support agency in their own region. Qualified IRCs make logical regional partners for us."

## Rapid roll-out

LIFT is currently negotiating agreements with a number of IRCs, including IRC Luxembourg-Trier-Saarland, based on a memorandum of understanding which sets out the principles and scope



*LIFT has produced a straightforward, practical guide designed to help research-based entrepreneurs find the financial backing necessary to create and grow their businesses.*

of the co-operation – from simple promotion of LIFT through to full mutual referral of clients.

"At present, only a few IRCs have the skills to act as local LIFT partners," says Fraser. "But if the arrangement works well in the first few pilot cases, we think it could spread quite quickly." ●

(1) See 'Need a LIFT?', edition 3/99.

(2) See also this edition's dossier on financing innovation, which starts on page 6.

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# Innovation Emissaries

*This summer, IRC Eastern England offered eight undergraduate students valuable work experience. It sent them on month-long placements in IRCs all over Europe, where they initiated contacts between local companies and Cambridge-based firms.*

In its role as a BIC<sup>(1)</sup>, St. John's Innovation Centre had for some time acted as an agent for the Shell Technology Enterprise Programme (STEP). The scheme subsidises the placement of students in small companies, giving them work experience and offering the host companies an opportunity to experiment with graduate recruitment," explains STEP co-ordinator Ruth Puddick.

When Shell extended STEP into an international programme, Puddick was keen to participate – both as a contribution to the

development of a local culture of entrepreneurship, and as a cost-effective means of furthering the IRC's own objectives.

After a week's preparatory training, each student spent between four and six weeks in one of the seven IRCs abroad, where they visited local companies to explore the potential for technology transfer collaboration with clients of IRC Eastern England. On their return, they passed on full details of their contacts, which are now being followed up by qualified IRC staff.

IRC manager Alex Smeets is delighted with the results, and plans to run the programme again next year. "All the students succeeded in generating a substantial number of leads," he says. "In each case these include two or three which look very promising. We have also had positive



*Seven Cambridge University students travelled to other Member States this summer, and worked to establish links for local companies.*

feedback from the host IRCs, several of which want to launch a similar scheme themselves." ●

(1) See this edition, page 16.

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## GOOD PRACTICE

# A High Standard of Service

*Each Innovation Relay Centre operates in a different business environment, and has developed its own methods for performing common tasks. As the network matures, the challenge is to adapt best practice to local circumstances, in order to ensure a uniformly high quality of service.*

The first three in a planned series of six IRC Good Practice workshops<sup>(1)</sup> took place in May and June in Seville, Berlin and Lyon. In addition to the expert speakers, more than 60 IRC staff members from over 40 different IRC partner organisations attended the events – which are proving extremely valuable as a platform for the identification and exchange of good practice.

## Go with the flow

In assisting local companies to

acquire or provide technological solutions across national borders, each IRC performs a common set of key operational processes, all of which have been covered in the workshops. "The presentations which dealt with tools for managing the flow of information between the IRC and the network, and between the IRC and its clients, were received with particular enthusiasm," says Arturo Menéndez of Idetra, who is organising the workshops as part of a study of good practice in the network.

Each IRC has developed its

own procedures for handling the very large volume of information passing through the network. Several have built impressive systems, which enable them to direct technology partnership opportunities very efficiently to client companies. But these systems have been developed in different organisational contexts, to serve clients operating in different market environments and different business cultures.

"Its close and direct links to a pan-European network form an increasingly important component of each individual IRC's ser-

vice offer," Menéndez points out. "The lack of shared methods of managing this data is now becoming a problem. There is real demand for greater standardisation – although it is not yet clear how the considerable expense of adapting the necessary common tools will be met."

## One for all?

The three existing IRC information management tools presented at the workshops by IRC Finland, IRC Cenemes and IRC Western and Southern Sweden





all appear to be possible candidates for adoption across the network.

"Of course," Menéndez says, "each tackles common tasks in slightly different ways. Cenemes' Augusto system, for example, is designed to automate the distribution to local companies of new technology offers and requests via e-mail<sup>(2)</sup>. Elsewhere, it may be more appropriate to notify a client of such opportunities in a personal telephone call."

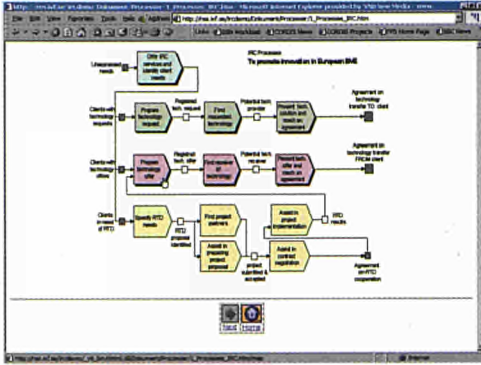
Max Maupoix, IRC Western and Southern Sweden's co-ordinator, presented its web-based management tool in Lyon. It provides an accessible but secure means for all the partners in an IRC consortium to record, analyse and streamline direct company contacts, more general promotional activities, and their results. "The tool attracted considerable interest, and has since been tested by several IRCs, which have given us

very positive reactions," says Maupoix.

Now, Menéndez says, the IRCs must decide whether each should be free to choose the system it prefers, from a menu of proven options, or whether a single system should be adopted across the whole network. The report containing his recommendations will be sent to each IRC in November, soon after the final workshop.

(1) See 'Learning from Experience', edition 4/99.

(2) See 'Automating Technology Transfer', edition 2/99.



IRC Western and Southern Sweden's web-based IRC management tool includes this simple flow chart of technology transfer processes, which serves as a training resource and the basis for evaluation and improvement.

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 A demo of the IRC's management tool is available at  
<http://res.ivf.se/ircdemo> – log in with username 'user' and password 'user'.

TECHNOLOGY TRANSFER EVENTS



# High-Tech for the Service Sector

*Within 12 months, two French technology transfer events have produced three signed co-development agreements between local companies and partners in Germany and Spain. One of the events applied the winning technology brokerage formula in a non-manufacturing sector for the first time.*

We based the format of both events on the experience we gained when we organised the very successful 'Vehicle of the Future' event<sup>(1)</sup> in September 1996," says Laurent Volle, project manager of the IRC France Centre-Est. "Each was held during a major trade fair, and focused on a clearly-defined technological area related to the subject of the fair. We placed the emphasis on inward technology

transfer, carefully selecting a small number of companies from around Europe, whose presentations were followed by a series of pre-arranged one-to-one meetings with local technology users."

**Small is profitable**

Besançon is the centre of a dynamic French microelectronics and micromechanics industry,

and the MicroSystems event was held during the city's Micronora fair, one of Europe's largest in this field.

"The number of potential IRC clients in the area of microtechnologies is very high, not only here in France, but around Europe," says Volle. "The brokerage event concentrated on micro-actuators and sensors, and by promoting it through the IRC network we were then able to

attract 15 excellent technology providers."

As a result of initial contacts made during the event, two German participants have since concluded formal agreements with local French firms – one for the joint development of magneto-resistive materials for use in sensors, and the other for the transfer of a piezo-ceramic technology with applications in both sensors and actuators.





Service sectors such as road transport also require innovative technologies in order to remain competitive.

•••  
**New clients**

Dijon lies at a key intersection of Europe's road, rail and waterway networks, and has been chosen by many European hauliers as the 'hub' of their distribution systems. Every two years, the city hosts FIST, an inter-regional

forum for industrial subcontractors. It was at FIST that IRC Centre-Est staged the 'Vehicle of the Future' event, and last September it used the same setting for NITEL, which focused on new information technologies for logistics and transport applications. "For us, this was a new

departure," says Volle. "As a service-oriented sector, freight distribution has largely been overlooked by the IRCs but, of course, it too requires new technologies. We wanted to test its potential as a client base."

The results were promising. One Spanish participant with an innovative software technology for Internet-based freight brokerage rapidly reached an agreement for the exchange of technologies with a French company which had developed a different solution for the same application. By making their systems interoperable, each will expand its market, giving transport companies and their customers throughout France, Spain and Portugal real-time access to a highly cost-effective means of matching loads to trucks.

**Thanks, partner**

In addition to the three deals already finalised, the two events have generated at least 17 other

fruitful contacts between French companies and technology providers in other Member States, which are the subject of ongoing negotiations.

"This success relies heavily on support from other IRCs. In particular, IRC South Germany-THATI and the IRC Cenemes were instrumental in identifying the right technology providers for these events," Volle concludes. ●

(1) See 'Tapping the Potential of Local Industry', edition 2/97.

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PERFORMANCE INDICATORS

# Measured Progress

*Since October 1995, the Innovation Relay Centre network has helped nearly 40,000 client companies with potential transnational technology transfer ventures. Of these, around 4,000 entered into negotiations with new customers, suppliers or partners, and nearly 500 have signed agreements.*

**S**ince its earliest days, the IRC network has monitored the results of its work in order to measure its effectiveness and impacts, and as the basis for progressive improvement of its working methods.

Every six months, each IRC reports on its contacts with small and medium-sized enterprises and other client organisations. In particular, in-depth assistance in support of cross-border transfers of new technology is closely monitored. Such transfers may

take the form of purchases of technologies or services, licensing agreements, and joint development partnerships.

**Solid success**

"The intention is not to compare the performance of individual IRCs, but to provide a management tool for the network as a whole," says IRC Co-ordination Unit Manager, George Barton.

The system of performance indicators used by the IRC net-

work was recently singled out as an example of good practice in the report "Designing Tomorrow's Commission: A review of the Commission's organisation and operation", completed in July.

"We have progressively clarified the definition of a technology transfer 'success'," Barton says. "A technology transfer is now counted as a success for the network, and for the IRC concerned, only when an agreement has been concluded between parties in different network countries,

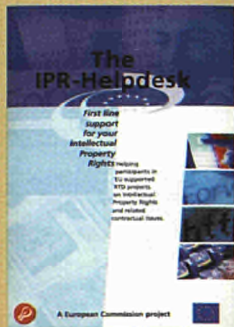
which results in a transfer of technology from one to the other." ●

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## The IPR-Helpdesk – First line support for your intellectual property rights



The IPR-Helpdesk, established by the Innovation and SMEs programme in 1998, has published this brochure which outlines its services and provides case studies of queries handled in its first year.

Designed as a service for participants in EU-funded research projects who have queries on issues relating to intellectual property rights, the Helpdesk offers both general advice and information on IPR issues and specific advice tailored to individual cases – including referral to national patent offices where appropriate.

### Contact:

**IPR-Helpdesk**  
 Tl. +352 471 1111  
 Fx. +352 471 11160  
 E-m. [info@ipr-helpdesk.org](mailto:info@ipr-helpdesk.org)  
<http://www.cordis.lu/ipr-helpdesk/>

## Innovation Diffusion and Political Control of Energy Technologies

ISBN 3-7908-1205 -6; DM 128

This study, by K.M. Weber of the Joint Research Centre's Institute for Prospective Technological Studies, investigates the processes which have produced very different innovation pathways for the diffusion of combined heat and power generation in the UK and Germany since the 1980s. The author uses this investigation to illustrate a wider thesis concerning the opportunities for political control of large-scale socio-technical change – and its limitations.

### Contact:

**Physica-Verlag**  
 Fx. +49 30 8 27 87 301  
 E-m. [orders@springer.de](mailto:orders@springer.de)

## European research open to the world

This new brochure, setting out the aims and activities of the European Commission's programme for International Co-operation in research (INCO), is now available on-line. It explains why INCO was set up under FP4, and outlines the enlarged framework for European science and technology co-operation under FP5 – how the COST initiative assists 28 European countries to co-ordinate their

research activities, the role played by Eureka, and how the EU co-operates with non-European industrialised countries and those of central and eastern Europe.

### Contact:

[http://europa.eu.int/comm/dg12/intco/achieve/index\\_en.html](http://europa.eu.int/comm/dg12/intco/achieve/index_en.html)

## A road to European co-operation: Industrial and Materials Technologies programme 1994 to 1998

The 'Thematic Networks Initiative' of FP4's Industrial and Materials Technologies programme, Brite-Euram III, promoted co-operation between researchers working on similar industrially relevant research or technological development. This on-line publication highlights the impacts of co-operation and collaboration on initiatives in the industrial sector. It also presents synopses of the 100 operational thematic networks, which may be of assistance to participants in FP5.

### Contact:

<http://europa.eu.int/comm/dg12/brite-eu/thematic/index.html>

## PROSOMA CD-ROM – fifth edition

PROSOMA is the service for researchers and businesses, offering easy access to the results of EU research in the information and communications technologies field. This new version of the CD-ROM contains 690 results from the Esprit, ACTS and Telematics Applications programmes.

### Contact:

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## 2nd Conference of the Biotechnology and Finance Forum: Summary report

The report includes information on all the main topics of discussion at the event, which took place in Lyon in March 1999, organised jointly by the European Commission and the European Association of Securities Dealers to develop entrepreneurial initiatives and promote small biotechnology research-based firms in Europe. Among the main points to emerge was the need for increased support for young entrepreneurs, and for broader dissemination of information about intellectual property rights to scientists. €100

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## JRC Institute for Reference Materials and Measurements – Annual Report 1998

The institute is evolving in line with the changing role of the Joint Research Centre as a whole, and the major scientific achievements highlighted in the report focus on customer-related issues rather than the more traditional nuclear studies. In 1998, the institute produced the world's first certified reference materials for detecting genetically modified organisms in food, and collaborated in the evaluation of BSE post-mortem tests. It also developed chemical reference measurements for tracing hazardous substances in cosmetic products, and for the detection of radionuclides, trace elements and antibiotics in food.

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<http://www.irmm.jrc.be/>

## Information from Space (CD-ROM)

The European Commission's Centre for Earth Observation has produced this CD-ROM, available in English, French, Italian, Spanish and German, in order to make non-specialists aware of the broad range of possibilities offered by satellite information.

### Contact:

**CEO Helpdesk**  
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<http://ewse.ceo.org/anonymous/construct/build.pl/684753>



**CRIS 2000 – 'Knowledge at work – research information for society'**

**25-27 May 2000, Helsinki (Finland)**

Via the Internet, research information is now being made available in a range of accessible and user-friendly ways. With the emergence of the Web, Current Research Information Systems (CRIS) have evolved into dynamic interactive information resources, and are now an important means for technology transfer, collaboration between organisations, and public access to research information.

CRIS 2000 will address the technological challenges to making information on current research available for the benefits of all sectors of society – including the development of multimedia databases on the Web. The event will incorporate plenary sessions, cybercafé demonstrations, poster sessions and round tables on special interests.

Conference topics include:

- the CRIS product – creation and dissemination of current research information
- CRIS usage – tailoring research information to user needs
- public interest in CRIS – research information in contemporary society
- the future of CRIS – research information in the next decade

Contact:  
<http://www.cordis.lu/cris2000/>

**Biotechnologies for diagnosis – health, environment, food and agriculture**

**16-17 March 2000, Strasbourg (France)**

Together with the neighbouring areas of Baden-Württemberg and Basel, Strasbourg and the wider region of Alsace are part of a 'golden triangle' of research and innovation. It has one of the highest densities of laboratories and researchers in Europe, with particular strength in the field of life sciences. Aimed at companies, technology centres and laboratories in the health, food, agriculture and environment sectors, this event will include presentations of the latest diagnostic applications of biotechnology, with opportunities for pre-arranged individual meetings between technology suppliers and potential users.

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**Aquatherm – technology transfer event**

**29-30 March 2000, Vienna (Austria)**

Staged in the context of the Aquatherm conference, this technology transfer event is designed to facilitate collaboration between technology suppliers and users in the fields of construction technology, biological sciences, environment, environmental protection and waste management.

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**ICSE 2000 – Turning IT research into practical solutions**

**4-11 June 2000, Limerick (Ireland)**

The organisers believe that we must seek to facilitate the transition of technology from research into practical applications, while tightening up the feedback loop from practical experience into research. Bringing together researchers and professionals from across the globe to discuss the research relating to information technology (IT) for the next millennium, the ICSE 2000 conference aims to provide the foundation for software engineering for the next millennium.

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**Neutron field spectrometry in science, technology and radiation protection**

**5-8 June 2000, Pisa (Italy)**

This workshop will review the state of the art in neutron spectrometry, report on recent developments and improvements, and demonstrate the technique's many applications. Some topics, such as workplace radiation from field analysis and neutron diagnostics in plasma experiments, will be discussed in working groups.

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