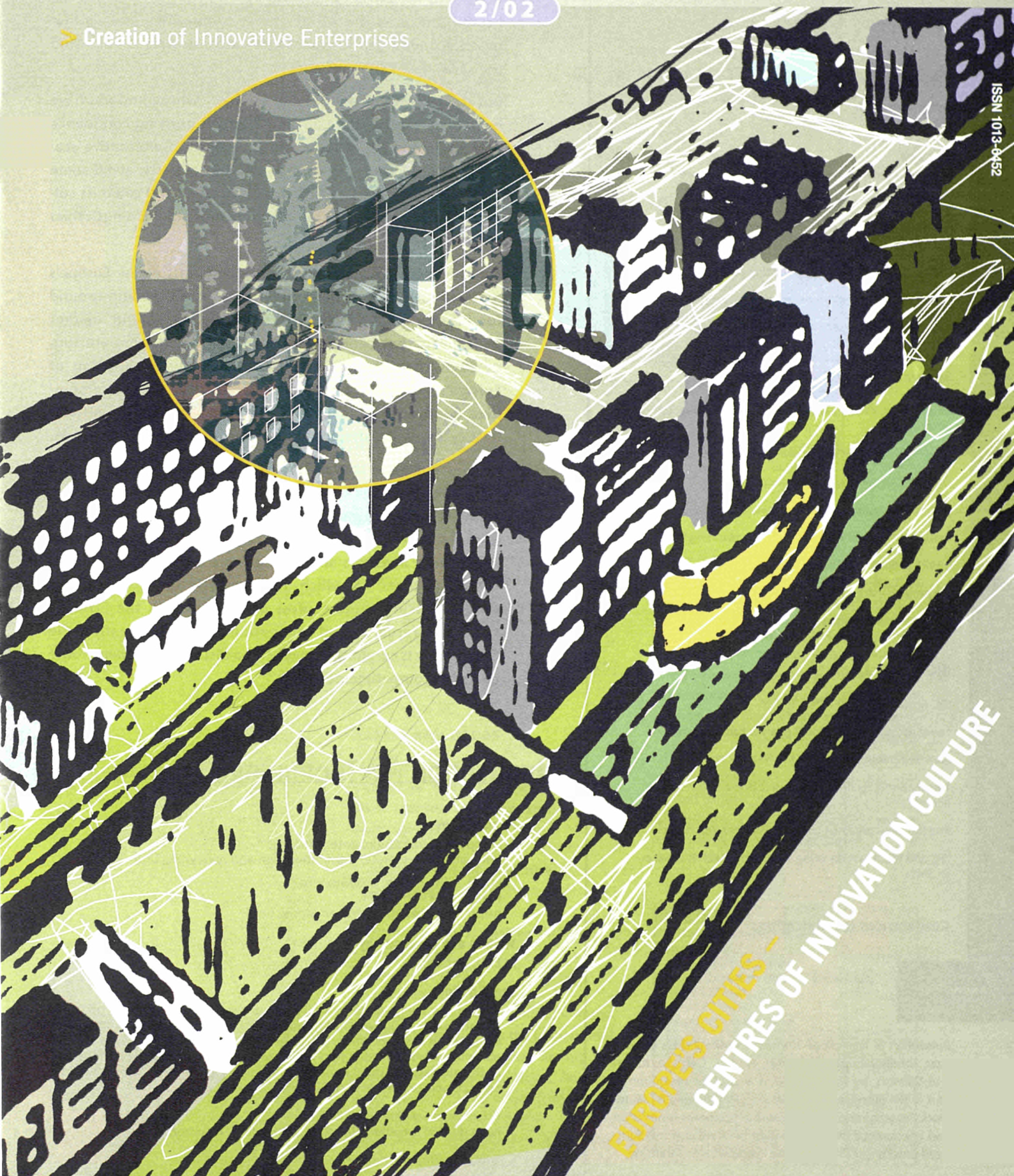


# Innovation & Technology Transfer

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> Creation of Innovative Enterprises

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EUROPE'S CITIES -  
CENTRES OF INNOVATION CULTURE



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## Fragmentation or diversity?

According to conventional wisdom, in order to overtake the United States as the world's most competitive knowledge-based economy Europe must first catch up with it, following the same development path.

But the collapse of the dotcom bubble – whose impacts have been far greater in the US – and Europe's growing confidence in a 'social model' of innovation, suggest an alternative scenario. Could Europe, by coming late to the party, avoid some of the dangers faced by America's pioneers? And could its cultural diversity turn out, after all, to be more of a strength than a weakness?

Some leading entrepreneurs are beginning to view Europe's undoubtedly difficult domestic market as a breeding-ground for international excellence (see page 4). Labour market 'inflexibility' has benefits as well as costs. And there are suggestions that the diversity and geographical diffusion of Europe's high-tech clusters, often cited as a source of competitive disadvantage, may buffer them against the boom and bust cycles which affect Silicon Valley's much denser networks.

Of course, Europe still has a long way to go (see page 3), and EU enlargement will create new challenges. But, as our dossier article (starting on page 8) shows, Europe already has a significant number of cities and regions where clusters of researchers, investors and companies are creating local innovation cultures in which high-growth entrepreneurship thrives. Linking these centres of excellence in the EU-wide system of research and innovation to whose creation the Community is committed may offer a distinctly European route to global competitiveness. ≡

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➤ European Competitiveness

# Keeping up with Uncle Sam

The European Commission's 2001 Competitiveness Report shows that slower introduction of new technologies is holding back EU performance compared to the United States. The 2001 Enterprise Policy Scoreboard confirms that although progress has been made in many areas, there is room for much more.

Launching the two reports, Erkki Liikainen, European Commissioner for Enterprise and Information Society, focused on the European Union's GDP per head, which remains less than two-thirds that of the US. "The key issue," he said, "is to explain why, despite solid growth, we are losing out to the US in terms of competitiveness and living standards."

Two factors contribute – the EU's lower employment levels, and its lower average output per person. The performance of Ireland, Finland and Luxembourg is above average in both cases, but that of the four largest European economies is at best average. Since the mid-1990s, US productivity growth has accelerated while the EU's has slowed.

## Competitiveness

The competitiveness report highlights two areas where investment will be critical for productivity growth – information and communication technologies (ICT) and technological innovation. ICT is innovative in itself and underpins almost all other economic activities. But, at 2.4% of 1999 GDP, ICT investment in the EU is around half that in the US (4.5%). This may have cost up to 0.5% in annual GDP growth.

Other sectors examined by the report are manufacturing industry and biotechnology. During the 1990s, growth in overall EU productivity was far below that of the US, although the EU showed higher growth in some sectors. Ireland and the Nordic countries made faster gains, but innovation has reduced the differences

between Member States, particularly in technology-driven industries like pharmaceuticals and aeronautics.

European biotechnology is typified by small, specialised companies operating in clusters, which entered the market later than US rivals, secured fewer patents, and were slower to set up collaborative networks. The report calls for a wider range of research funding sources, and better integration of research with teaching, clinical studies and medical practice.

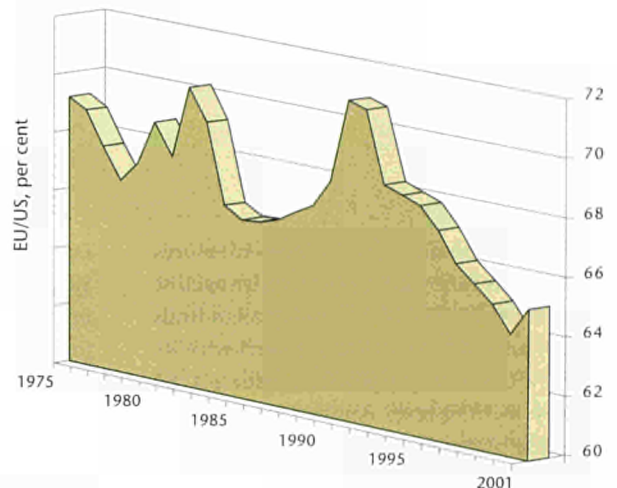
## Seven key areas

The Enterprise Policy Scoreboard assesses a range of national indicators which, taken together, show how each Member State is performing on:

- access to finance
- regulatory and administrative environment
- open markets
- innovation and knowledge diffusion
- entrepreneurship
- human resources
- new technologies

In the area of new technology, for example, the Netherlands has the highest level of internet penetration and among the cheapest telecommunications. Another useful measure is the share of high-tech products in exports. In most Member States this is increasing, with greatest progress being made by Ireland, France,

GDP per head in EU-15, % of US level, 1975-2001  
European Commission, Enterprise DG



The EU's economic output per person has fallen steadily behind that of the US since the early 1990s.

Finland, Luxembourg and Greece. But for the EU as a whole, high-tech's share of exports is just two-thirds of that in the US.

Industry ministers meeting in December welcomed the reports' conclusion that the EU is learning to promote entrepreneurship by encouraging innovation and reducing red tape. They considered ways to strengthen this trend, including reform of business legislation, and tax incentives for research. The Commission has also started to look at the possibility of using quantitative targets in enterprise policy, to be set by each Member State.

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The *European Competitiveness Report 2001* is available at [http://europa.eu.int/comm/enterprise/enterprise\\_policy/competitiveness/doc/competitiveness\\_report\\_2001/index.htm](http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/competitiveness_report_2001/index.htm)

*Benchmarking Enterprise Policy: Results from the 2001 Scoreboard (SEC (2001) 1900)* can be downloaded from [http://europa.eu.int/comm/enterprise/enterprise\\_policy/competitiveness/doc/sec\\_2001\\_1900\\_en.pdf](http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/sec_2001_1900_en.pdf)



► Entrepreneurship

# Heroes of the revolution

With the collapse of the internet bubble pushing the US economy into a recession that could turn out to be deeper and longer than in the European Union, it may be time to reassess the relative strengths of the innovation systems on either side of the Atlantic.

The European Commission measures Europe's innovation performance against that of the US – and in many areas finds it wanting<sup>(1)</sup>. Few would quarrel with its view that technological innovation is the key to long-term competitiveness, but some observers now believe that it overstates the US lead. GDP per worker – the figure the Commission uses as a measure of productivity growth – takes no account of recent increases in part-time working in Europe. In the ten years to 2000, GDP per hour worked grew by 1.9% in the euro zone, and by only 1.6% in the US<sup>(2)</sup>.

## Upbeat

Certainly, the mood at the European Entrepreneurship Summit<sup>(3)</sup> in Munich last November was predominantly positive. The threats of global recession and global terrorism, and the acknowledged administrative and linguistic overheads borne by European innovators, were both causes for serious concern.

But many speakers pointed to areas in which Europe's innovation culture demonstrated distinct strengths, and there were calls for an end to 'Euro-pessimism'. Corporate investors, venture capitalists and entrepreneurs all expressed relief that the 'irrational exuberance' of the 1999-2000 bull market was over. "Paradoxically, this is a time of tremendous opportunity," said Bernard Vergnes of Microsoft Europe. "A culture of entrepreneurship has been established despite the fiscal and administrative barriers. Many of the new venture capital funds have survived the downturn, and quality is coming to the top. It is a good time to invest, and a good time to be an entrepreneur."

Dr Heinrich von Pierer, President of Siemens, described the industrial giant's innovation-based turnaround as essential for its survival. "Innovation is like a steamroller – either you are on it, or you are part of the road. Siemens has become one of the most R&D-intensive companies in the world, spending €6 billion on research each year and incentivising entrepreneurial risk-taking throughout the organisation, he said. Its reward is that products less than four years old now account for 75% of sales.

But Siemens does not espouse the US model of labour flexibility. "There is no conflict between profitability and job security. They are two sides of the same coin," von Pierer believes. And Nicolas Gaume, the young Chairman and CEO of French gaming software house Kalisto Entertainment, pointed to Sweden as "a high-tax economy that is now more innovative than the US".

## Can do better

Indeed, Europe's innovation system has rapidly been catching up with that of the US, and may now be better placed to meet the challenges of globalisation than ever before.

In the past decade, large European companies have rapidly decentralised, learning to outsource non-core activities through partnerships with smaller, specialised enterprises. "And in just five years, Europe has developed a venture capital market and a culture of entrepreneurship which took half a century to build in the US," said Larry Levy of the Protégé venture fund. "Mistakes were inevitable, but what we take forward from



Clusters are critical, and Dirk Kanngiesser of PolyTechnos Venture-Partners highlighted three European regions in which the concentration of business and research networks may soon rival that of Silicon Valley.

the difficulties of the past year is a real European environment for innovation."

There was also realism about the barriers that Europe still has to overcome. "European entrepreneurship tends to be regional or local," said Robert Schneider of SCM Microsystems, founded in Bavaria in 1990 but already a global IT industry leader. "It took us 12 months to negotiate a deal for 2,000 units of our first product with Siemens. Within six months of entering the US market, we had sold 50,000. It is much harder for innovative, young companies to compete with larger incumbents in Europe."

Vergnes highlighted the constraints imposed on staff mobility by the variation between Member States in the tax treatment of stock options. He gave the example of an employee that Microsoft

(1) See this edition, page 3.

(2) The Economist, editions of 10 November 2001 ('Statistical illusions') and 8 December 2001 ('Irrational pessimism').

(3) Organised by Dow Jones Conferences for the Wall Street Journal Europe, <http://www.djconferences.dj.com/>



Among the winners of the European Technology Innovation Awards 2001, presented at the summit, was the BGR PrivaCam system. The system – here, in operation at KPN Research Labs in Leidschendam – splits the captured image into two pieces. On the left, a 'noisy' partial image. On the right, the image reconstructed by 'adding back' the missing information. Employees' privacy is protected unless a security alert makes reconstruction necessary.

wished to move from Brussels to Stockholm, who would have been taxed twice on the same stock.

And European attitudes to risk remain far more cautious than the US – in industry, among venture capitalists and individual investors, and among entrepreneurs. "Americans say 'it's new, let's do it', while Europeans say 'it's new, let's not do it'," said high-tech investor and commentator, Esther Dyson.

### From across the pond

Eric Benhamou, Chairman of 3Com Corporation, the US networking and connectivity leader, went further. "There is a lot of guilt associated with profitability in Europe," he said. "You still think of it as a form of stealing."

Highlighting the density and maturity of Silicon Valley's high-tech research, investment and entrepreneurial networks as a key source of US innovation, he sum-

marised the American view of Europe's fundamental handicaps. "As a proportion of GDP, there is only one-third of the venture capital available in the US. The inflexibility of EU labour laws is a major source of competitive disadvantage. And entrepreneurship remains undervalued – few European politicians ever celebrate entrepreneurs as heroes." ≡

## ➤ Innovation and Creativity

# A liberating experience



At its autumn conference, the Six Countries Programme brought together members of the innovation and the creative communities. The merging of cultures that resulted produced a call for greater awareness of creativity's importance in realising competitive advantage.

Creativity is easily overlooked in innovation policy, even by the European Union. It gets filed with the arts in a drawer marked 'culture', while innovation is included with science and technology under 'R&D'. Promoting creativity is an explicit objective of the EU's Culture 2000 programme<sup>(1)</sup>. Yet the word is hard to find in the documentation of its Research Framework Programme.

Run back-to-back with the Seventh Irish National Innovation Conference, the Six Countries Programme (6CP) event was an attempt to counteract this compartmentalisation by 'merging innovation cultures', in the words of the conference's title. An early session on creating value through innovation and applied creativity was addressed by Jorma Routti, formerly the European Commission's Director-General for Research. Later

sessions dealt with auditing creativity in innovation, and with managing and developing creativity. They were complemented by workshops on arts and technology, government policy, education, and business strategy<sup>(2)</sup>. >>>

*(1) Decision No 508/2000/EC of the European Parliament and of the Council of 14 February 2000 establishing the Culture 2000 programme, downloadable from [http://europa.eu.int/comm/culture/c2000condition\\_en.html](http://europa.eu.int/comm/culture/c2000condition_en.html)*

*(2) The conference programme, together with an overview and a review, are at <http://www.6cp.net/Archive49.htm>*



Approaches used in the creative industries can help to unlock innovative potential in other sectors, believe the partners of the Six Countries Programme.

## Top to bottom

The 6CP is a network of experts, policy-makers and practitioners with an interest in innovation and innovation policies. Its members, now nine in number, include seven EU Member States, together with Canada and Hungary. Annual spring and autumn conferences, at which attendees are encouraged to take fresh perspectives, are its main activity.

The focus on creativity of last autumn's conference grew from differences between policy-making approaches across the border between Ireland and Northern Ireland. Following the British lead, a policy-overview approach has led the way in Northern Ireland, explains Dermot O'Doherty. A member of the Six Countries Steering Group, he is a senior advisor on technological and innovation policy in the science, technology and innovation division of Forfás, Ireland's Industrial and Technological Policy Advisory Agency. He is currently on secondment to InterTradeIreland, a unique cross-border industrial and business development body. By contrast, he says that a bottom-up orientation has predominated south of the border, starting from projects and industry sub-sectors.

In the UK policy environment, the creative industries have won a lot of government attention. A regular audit of the sector established by the Department of Culture, Media and Sport in London has found that the UK's creative industries generate revenues of €98 billion and exports of €13 billion each year, and are

growing more than twice as fast as the British economy as a whole.

"And in Northern Ireland, the Department of Culture, Art and Leisure, together with three other departments, has recently produced a policy document, 'Unlocking Creativity', very much in the British mould," O'Doherty says.

Initial moves in this direction were eventually made south of the Irish border three years ago. "The chief executive of the Arts Council and the chairman of the Irish Council for Science, Technology and Innovation – two strong personalities – wanted to bring the areas of innovation and creativity together. They were part of the inspiration for the conference," he explains.

## Divide and rule

In fact, the conference bridged not just the divide between creativity and innovation but others too. As with all 6CP conferences, it united people from the nine member countries. It linked Ireland and Northern Ireland. But perhaps most importantly, it mixed people from the creative industries and from other industrial sectors.

"There is a lot of evidence that matters considered important for innovation in established industry, such as quality management, can have a negative effect on the expression of creativity because of their emphasis on conformity to a particular approach," says O'Doherty. The creative sector can play a leading role in

solving this problem. "One way a traditional company can benefit is through inviting people from the creative industries to engage their staff in creative thinking, to stimulate them to explore new approaches. Help of this sort might come from organisations like the De Bono Foundation, which is quite strong in Ireland and Northern Ireland."

A mark of the conference's impact has been the response of the Six Countries Programme. "Until now, 6CP has largely moved its spotlight from one topic to another without dwelling on any one. Now they want to make this a major theme for the coming years," O'Doherty says. The conference has kindled enthusiasm for benchmarking the sector – one outcome is a new resolve to roll out an audit and evaluation of the extent and importance of the sector in both Ireland and Northern Ireland in 2002.

The 6CP partners are also keen to communicate their findings and their future emphasis on creativity to the European Commission. ≡

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# Policy Notebook

## Spanish Presidency focuses on innovation

Spain, which took over the EU Presidency at the start of the year, is pressing for extension of the European Research Area (ERA) to include innovation. In January, Anna Birulés, Spain's Minister for Science and Technology, told the European Parliament that the aim was to make ERA into an integrated "area of innovation".

On 1-2 February, the Presidency organised the first ever informal joint meeting of research and industry ministers in S'Agaró-Girona, to consider innovation good practice and ways of strengthening links between the two policy areas. The ministers endorsed the Commission's recommendation, included in its report to the Barcelona European Council in March on implementation of the Lisbon strategy, to set a target of 3% of GDP for the overall level of EU public and private spending on research and development by 2010. Innovation strategy will be further developed at a conference on technology foresight to be hosted by the Presidency in May.

At home, Spain is introducing a series of policies to stimulate innovation. Funding for the national Profit programme rose by 17% in 2001, with the number of innovation projects increasing by 67%. A 'technical accreditation of innovation', to come into effect this year, will entitle innovative companies to receive automatic tax benefits (see also this edition, page 17). Wider legislative changes, in the form of a new Science Law, will increase flexibility by permitting greater mobility of researchers and new types of research contracts.

### Contact

<http://www.cordis.lu/spain/>

## New set of structural indicators

For the second year running, the Commission has published new proposals for indicators to be used to assess EU progress towards the Lisbon Summit's strategic goal of becoming "the most competitive and dynamic knowledge-based economy in the world" by the end of the decade. The Communication covers indicators in the field of employment, innovation and research, economic reform, social cohesion

and sustainable development, dropping eight from the previous year's list, and adding nine new ones. The new set of indicators, some of which are also included among those used in the Innovation Scoreboard (see the Special edition of October 2001), will form the basis of the synthesis report to be presented to the European Council in Barcelona on 15-16 March.

### Contact

[http://europa.eu.int/eur-lex/en/com/cnc/2001/act619en02/com2001\\_0619en\\_02-01.pdf](http://europa.eu.int/eur-lex/en/com/cnc/2001/act619en02/com2001_0619en_02-01.pdf)

## European Company Statute will save business € billions

After 30 years, EU legislation to create a European Company Statute was finally agreed by the Council last October. The statute, a key element in the completion of the internal market, will permit the establishment of a public limited-liability company within the territory of the EU as a *Societas Europaea* (SE). An SE can be set up by creating a holding company or joint subsidiary, through the merger of companies located in more than one Member State, or by the conversion of an existing company set up under national law. But Member States abandoned plans to include in the statute a common system of corporation tax (see this edition, page 17), and this will therefore remain at national level.

The new statute will enter into force in 2004, and the Commission hopes it will help companies to expand and restructure cross-border operations without the costly and time-consuming procedure of setting up networks of subsidiaries. It will also underpin employees' rights to consultation and participation. Both UNICE (the Union of Industrial and Employers' Confederations of Europe) and ETUC (the European Trade Union Confederation) welcomed the adoption of the statute.

### Contact

[http://www.europa.eu.int/comm/internal\\_market/en/company/company/news/index.htm](http://www.europa.eu.int/comm/internal_market/en/company/company/news/index.htm)

## Community patent stalled

EU heads of government failed to meet their target of establishing a Community-wide patent by the end of 2001, despite an extra meeting of ministers arranged for this purpose on 20 December. They

still hope to meet the June deadline for calling a diplomatic conference of the European Patent Organisation, in order to make the necessary amendment of the European Patent Convention.

Europe's innovation community – and Internal Market Commissioner, Frits Bolkestein – have been disappointed by the lack of progress. The main problem is the refusal of some Member States to compromise on issues related to the cost of translating patents (see 'A balance of interests', edition 1/02). But the Spanish Presidency is now actively looking for ways to achieve consensus, and a final decision was expected at a meeting of internal market ministers at the beginning of March.

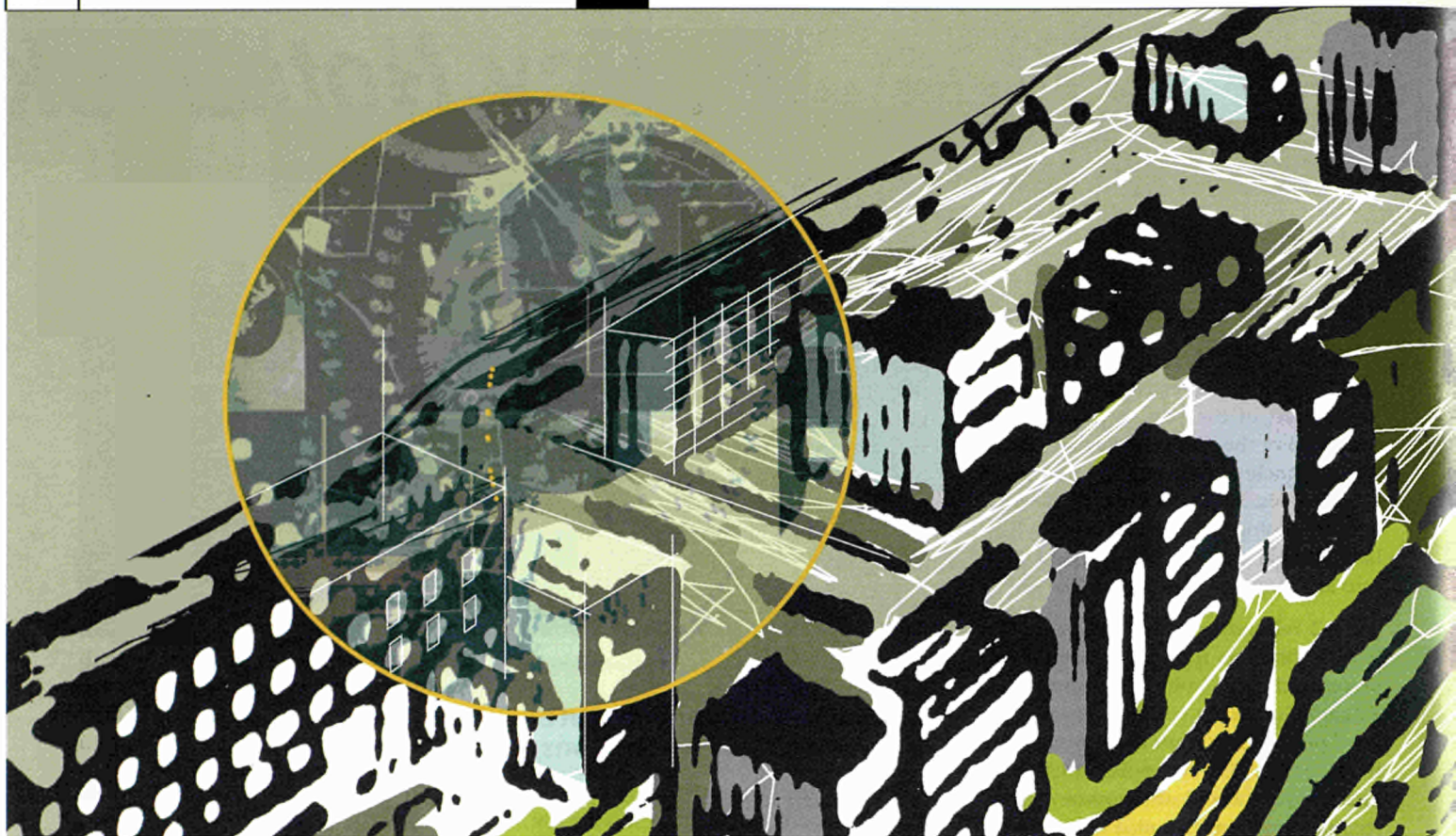
## Boost for innovative start-ups in France

A new scheme to stimulate the creation of innovative companies was announced by the French Minister of Finance, Laurent Fabius, at the beginning of January. It will be jointly funded by the European Investment Fund, the French government, and the Caisse des Dépôts et Consignations, a French public financing institution.

The initiative is in part a response to a recent dramatic fall in the amount of venture capital available to young firms. In March 2001, French start-ups raised €169 million of venture capital, but in November just €12 million. In contrast to the conventional approach of investing public money through private venture capital funds, the new scheme will make €60-90 million available for direct investment in innovative start-ups.

### Contact

<http://www.minefi.gouv.fr/minefi/recherche/index.phtml>



# Europe's cities – centres of innovation culture

The third European Forum for Innovative Enterprises is to be held in Stockholm next month. It will be the last opportunity to take stock of Paxis and its achievements before the start of the Sixth Research Framework Programme.

Paxis (the Pilot Action of Excellence for Innovative Start-ups) grew out of the first such forum over three years ago. "We held the first European Forum for Innovative Enterprises in Vienna in November 1998," recalls Jean-Noël Durvy, head of the Innovation policy unit at the European Commission's Directorate-General for Enterprise. "The question was how to improve entrepreneurship and create innovative enterprises in Europe. People were saying that too few new companies were being created in Europe, compared with the US, and that there were obstacles to their development. At the same time, we knew that there were good initiatives in Europe and wanted to show that Silicon Valley was not the only place where innovative enterprises can flourish."

Paxis was launched in 1999 with three main components – thematic networks, specific projects designed to test new

approaches, and accompanying measures. The thematic networks are formed by 15 European cities and regions – designated 'European regions of excellence' – which have demonstrated unusual success in fostering new enterprises. "Many European cities and regions do perform well in

innovation and enterprise creation," Durvy says, "The best known examples are probably Munich and Cambridge, and they are among the 15. That was the first aim of Paxis, to show that there are already excellent regions in Europe."

## 1. Building tomorrow

The Community of Madrid is using its strong research base as a platform for new business activity.

Madrid, one of the Paxis regions of excellence, is an autonomous region of Spain with a population of some 5 million and a rich concentration of scientific and technological research centres. "In terms of pure science we are very well based and supported," says Dr Teresa Calatayud, Director-General of Research in the re-

gional government. "But in terms of entrepreneurship we know that we have some weaknesses, so we were very interested in the opportunity to learn from other regions. We wanted to translate our potential into real effects and of course we were also interested in economic growth, sustainable development and so on."



**“Silicon Valley is not the only place where innovative enterprises flourish.”**

Madrid's present success is due in no small measure to its earlier participation in a Commission RITTS (Regional Innovation and Technology Transfer Strategies and Infrastructures) programme which in turn led to the region establishing a four-year innovation plan. "All the actions that we are now doing are based on this very early success – the identification of our weaknesses, strengths and opportunities in the framework of the RITTS initiative," says Calatayud.

### Learning from mistakes

Of the four networks of regions of excellence set up under Paxis, Madrid takes part in Spring (Speed-up of Regional Innovation and Economic Growth) along with Stockholm, Cambridge and Stuttgart. The partners' four priorities are intellectual capital, entrepreneurship, venture capital and innovation culture.

Last autumn officials from Madrid visited Stuttgart to learn how to make best use of seed capital for new businesses. "For us that was quite innovative and we decided to adopt a similar strategy through our regional system," comments Calatayud. Contacts like this not only help partners learn from each others' successes but also from their mistakes. "In our department we say that we often learn more from bad experiences where we know exactly what went wrong, than from a successful outcome at the first attempt."

In return, Madrid offers its partners a model of how to create an innovation culture. "I think this is one area where we are in the lead," Calatayud says. "Every six months we have a full week devoted to activities to inform our citizens about the work going on in the research centres. Last November we organised a week of open days in the research centres with many events about science, technology and innovation. We distributed a brochure to 1 million Madrid citizens and the results have been really impressive. Thousands of people attended the different museums, research centres and exhibitions to find out about things like

entrepreneurship, venture capital and innovative firms. It was a huge amount of effort, but produced an incredible result."

### Cross-border

Apart from the thematic networks, Paxis includes 24 specific projects aimed at the dissemination and transfer of good practice in support of the creation of start-up companies. These projects are not restricted to the regions of excellence – although they feature strongly – and the partners include universities, science parks, technology parks, and similar institutions.

One such project launched by the Madrid regional government is called Priaces (Integrated Regional Policy for the Support and Creation of Spin-off Enterprises). In this case Madrid can call upon

a panel of experts from Finland, the Netherlands and Scotland. One of the most notable successes of Priaces is a project called Vivero Virtual de Empresas – the virtual spin-off incubator.

"The virtual incubator provides services for entrepreneurs from training to access to venture capital, as well as mentorship, market studies and access to physical facilities," Calatayud explains. "The possibility of putting this project into operation with the help of other European experts was really very attractive. We sent many people for education and training in Finland, the Netherlands and Scotland. We now have 26 new companies in an early phase and 27 in an advanced phase, and are certified as one of the national providers of this kind of service in Spain."

>>>

## See you in Stockholm

The Third European Forum for Innovative Enterprises, hosted by the City of Stockholm, will take place on 8-9 April. It will look at the latest trends in support for the creation and development of innovative start-ups, highlighting the experience gained in Paxis. Topics will include:

- Change as business opportunity
- Academia as business generator
- Cities as business incubators

The European Commissioner for Enterprise and Information Society, Erkki Liikanen, the Swedish Minister for Industry, the mayors of large European cities, and internationally acclaimed innovation specialists will debate policy issues related to these themes. At the conference dinner in Stockholm's



Carl Cederschiöld, Mayor of Stockholm.

City Hall, where the Nobel Prize gala dinner takes place, economic areas selected for their outstanding performance will receive the Paxis 'Award of Excellence'.

More programme details and registration information are available from the Forum website.

### Contact

<http://www.thirdforum.org/>



## PAXIS Thematic Network

### The innovation challenge

The KREO network is exploring the creation of innovative companies as a means of optimising industrial exploitation of research results.

KREO brings together the regions of Emilia-Romagna (Italy), Technologie Region Karlsruhe and Pforzheim (Germany), Lyon-Grenoble (France), and Oxfordshire (United Kingdom). Like all the Paxis 'regions of excellence', these four have outstanding track records in creating and supporting innovative enterprises, and are represented in KREO by:

- the Emilia-Romagna regional development agency, Ervet, which acts as network co-ordinator
- Karlsruher Existenzgründungs-Impuls, an association which stimulates and supports the creation of spin-offs from universities and research centres
- the Agence Régionale du Numérique in Grenoble, a focus for the region's digital and IT sectors
- Oxford Innovation, a subsidiary of the Oxford Trust, which provides services to universities, businesses, government bodies, and research centres

The partners share Paxis' objective of facilitating the spread of best innovation practices throughout Europe.

#### Start-up leverage

"Creating new companies is not a problem," says Sandro Testoni of Ervet. "The challenge is to use them to enhance the translation of research findings into marketable products and services. It is important not only to identify mechanisms that favour their creation and development, but also to determine where they are essential to innovation. This is the network's main focus. We have developed a methodology for identifying and analysing 'good innovation practices', defined as ones that strengthen interaction between research and industry, translate regional innovation



The Oxford Centre for Innovation currently houses 30 start-up technology companies, in sectors ranging from medical imaging to business-to-business e-commerce.

priorities into actions, and promote the start-up of new technology- or science-based firms."

Having scrutinised a wide range of innovation practices and experiences, the KREO partners have begun to pinpoint critical success factors, strengths, weaknesses, and synergies. They have listed best practices of high interest to each region – support mechanisms for small companies, knowledge and technology transfer intermediaries, networks exploiting synergies between spin-offs, interactions favouring the alignment of research activities with innovation policy goals, and measures encouraging qualified young people to become entrepreneurs.

The next step is to see how selected practices can be adapted to different regional settings. For instance, Oxford Innovation is co-ordinating a validation project, the KREO Finance Management Development Project, to study a business angel network (BAN), Oxfordshire Investment Opportunity Network. The

idea is to create similar structures in the partner regions, to provide support in enterprise management, and to exchange experience of education for entrepreneurs, especially ones with a technological or scientific background.

"KREO has reached a point where it can promote effective, long-term, cross-sector collaboration between innovation actors who have never before had the chance to work together," says Testoni. "This is what building a European research and innovation system is all about."

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The region's leading universities, research centres, enterprises and public authorities all promote their research activities at Madrid's annual Science Fair, which in 2001 attracted 50,000 visitors.

## 2. Tips and traps

Paxis is creating a body of experience from which policy-makers across Europe will be able to draw.

The third component of Paxis is a series of 'accompanying measures' which serve two aims. "One is the general promotion of all these activities, the networks and the projects," says Durvy's colleague Tomás Botella, project officer at Enterprise DG. "The other is the political interface. We expect to extract good practice lessons and experience that we can disseminate and promote at European level to say, 'these are good ways to support creation of enterprise', or 'take care to avoid going down this particular route'."

### Dynamic environment

The most important of these political initiatives is the prestigious European Forum for Innovative Enterprises. The first two meetings, in Vienna and Lyon<sup>(1)</sup>, were resounding successes – and the Commission expects the coming Stockholm event to be even better. As one of the 15 regions of excellence, Stockholm already has an enviable record of innovation.

"The fact that the Commission decided to hold the next forum in Stockholm is an example of the standing of the city in European terms," says Carl Cederschiöld, the city's mayor. "Since the 1990s, Stockholm has been a very dynamic environment for business, especially within new technological fields like information and

communication technology and biotechnology. In the last few years the number of biotechnology companies in the Stockholm-Uppsala region has doubled."

Stockholm is also the financial centre for the Baltic area. "Swedish banks and the Swedish stock exchange have rapidly adopted information technology in their daily operations," Cederschiöld explains. "The rationalisation and structural changes within the Swedish financial system occurred very quickly after the deregulation of the financial markets around 1989-90, and since then the financial and banking sector have been developing in a very positive way."

### Education

Education, too, is a key element of Stockholm's success, and Cederschiöld cites radical changes in primary and secondary schooling – parents can now choose freely between state and private schools – as a catalyst for making the education system more responsive and dynamic. "On top of that, the Stockholm-Uppsala region has traditionally been the major centre for higher education, research and development in Sweden and to a large extent for the whole northern European area. And this tendency has been even more marked in the last few years."

Gone are the days when academics considered themselves aloof from business. "That changed during the 1980s and now there is very close co-operation, especially between big companies and universities," he says. "Much of the research and development is paid for by private companies. Only the other day, Hans Rausing, the owner of TetraPak, committed €3.2 million a year for the next six years to Uppsala University."

As the Third Forum approaches, Botella is cautiously optimistic about the fruits of Paxis. "It is quite difficult to evaluate because the projects are not yet finished, but in October we had a meeting with the contract officers in charge of the accompanying measures concerning the political interface. I must say I was positively surprised by their work and the lessons that they extracted from all these activities. And it seems that some interesting partnerships have formed among the regions of excellence. For example, there will be a collaboration between Oxford and Lyon in the biotech sector – one of the fruits of the networking activities – but there are other examples of exchange of information, exchange of competence and the fostering of partnerships. Even the most proactive and dynamic regions can collaborate to be better still."

(1) See 'Achievement and Optimism', edition 1/01.

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## Synergies

With the Sixth Research Framework Programme being launched this autumn, where does Paxis go from here? "It is a bit early to say exactly what we will do in FP6," says Jean-Noël Durvy. "But my intention is to strengthen the integration of Paxis with other activities, also managed by the Innovation Directorate, which are pushing technology transfer, enterprise creation and so on. We have a network of venture capitalists involved in high-tech and early-stage financing, a network of organisations financing incubators, a network of technology transfer offices in universities, and we have the

'Gate2Growth' initiative<sup>(2)</sup> which organises training activities for building professional capacities. There are a lot of potential synergies between these activities and those of Paxis, so what I would like to do in the Sixth Framework Programme is to have better integration between all these initiatives." ≡

(2) See this edition, page 15.

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## Second PAXIS Call

### Taking the message east

Countries in Eastern Europe will benefit from lessons learned in the EU when the second phase of Paxis gets under way later this year.

Berlin, Copenhagen, Dublin, Edinburgh, Hamburg, Venice and Vienna will soon be joining the existing 15 European regions of excellence as a result of the second call for Paxis proposals last summer. Five new thematic networks are also being set up, along with six validation projects and three accompanying measures.

The projects in the second call cover two new areas. In the first, initiatives that have been shown to work in the EU will be extended to the Newly Associated Countries (NACs) – Cyprus, Malta and, in eastern Europe, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Charlotte Avarello, project officer at the European Commission's Directorate-General for Enterprise, gives an example. "Suppose you have developed a good incubator system for biotechnology companies in Germany or the UK. If those systems could be adapted for use in Poland or Hungary, taking into account the different contexts in those countries, we would support the transfer of good practices from

Cambridge or Karlsruhe to places such as Cracow or Budapest."

### 24/7 support

The other new type of project aims to promote new methods to foster the creation of innovative start-up companies.



Bringing start-up know-how to central European cities like Budapest.

Such new ideas might include telematic services like distance training, on-line consultancy, business and market information and on-line business administration services as one-stop-shops for start-ups.

A new kind of accompanying measure aims to set up two associations, one for

start-up companies and one for organisations that support them. "On one side we would have an association of start-up companies," Avarello says. "On the other we would have those which provide services to start-up companies, such as incubators, science parks, and so on. We hope to promote dialogue between these two groups at European level, to find improved ways to support start-ups."

Response to the second call was excellent, with 37 proposals for thematic networks, 57 for projects and 22 for accompanying measures. Of the 412 organisations applying to take part in projects, 146 came from the NACs. The Commission hopes to conclude the contracts by the middle of 2002.

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**PAXIS Validation Project**

## 'Practice' makes perfect

Lessons from Israel's 11-year track record in financing technological innovation will help policy-makers boost high-tech growth in Europe.

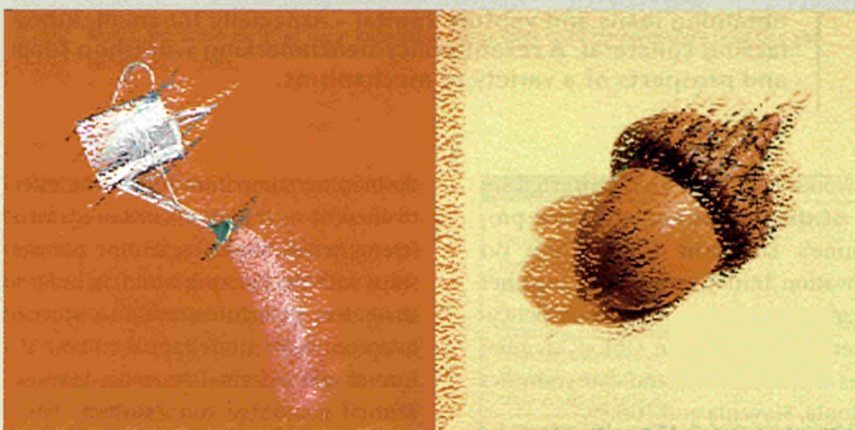
'Best practice' guidelines for the creation of investment capital could lead to improved growth prospects and fewer missed opportunities for Europe's high-tech start-ups. Following an analysis of Israel's Yozma and Technological Incubators programmes, which created hundreds of successful technology companies, the Paxis project Israeli Financing Innovation Schemes for Europe (IFISE) will identify success factors that can be transferred to Europe.

"The Israelis' extensive experience gives us a good idea of what works and what does not," explains Vittorio Modena, IFISE's project leader. The analysis will provide guidelines for designing innovation-financing schemes in European regions where venture capital remains scarce, helping policy-makers to improve public funding and incentive programmes.

### Adapt and transfer

The collapse of investor confidence in the internet and telecom sectors has made the need to define best practice urgent. "It means making best use of public money to exploit high-tech start-up opportunities in all sectors and regions," says Modena. For example, a wider range of initiatives would minimise Europe's exposure to a downturn in a particular sector.

Israeli success factors were analysed by Israel's University of Haifa, the Technion, Jerusalem's Institute for Israel



Italian innovators will soon be benefiting from Israel's experience of financing high-tech growth.

Studies, and Yigal Erlich, who initiated the Yozma programme. Lombardy, in Northern Italy, which has a strong concentration of potential entrepreneurs, will be the first European region to benefit. Appropriate Israeli financing concepts will be adapted to the region's high-tech potential, which was evaluated by the University of Pavia, the Italian association for private equity and venture capital (AIFI), and CAST, a Milan consultancy. Institutional as well as legal barriers will also be identified.

### Question of timing

In volatile high-tech markets, timing is of the essence. While Israel's Office of the Chief Scientist can make funding decisions or launch entire programmes within weeks, no such agency exists in Italy.

Synergies between venture capital and incubators also contributed to Israel's high-tech success. Incubators offer start-ups infrastructure and consultancy, and

fund the early stages of their growth before venture capitalists become interested. The integrated and 'generous' approach of the Israeli incubators is another critical factor that will be verified by IFISE's work.

IFISE's final policy recommendations will be produced in April. Modena expects that one or more incubator programmes will be implemented at national or regional level in Italy as a result, in addition to measures for overcoming specific barriers faced by Italian high-tech companies. The best practice models identified by IFISE's work will also be disseminated to policy-makers across the EU.

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► Innovation Finance

# Money-back guarantees

Guarantee schemes operate in most Member States, and can be a vital factor in obtaining loans and venture capital – especially for small, innovative companies lacking collateral. A recent policy benchmarking workshop focused on the role and prospects of a variety of mechanisms.

The workshop, one of a series which form part of the Innovation and SMEs programme's European Trend Chart on Innovation initiative, brought together guarantee scheme managers and policy-makers from European Union Member States and from three candidate countries – Estonia, Slovenia and Turkey.

Public sector guarantees could significantly increase the availability of loans and equity finance, so vital for young and

developing companies<sup>(1)</sup>. But the effectiveness of such mechanisms needs to be strengthened through genuine partnerships with the banking world, in order to share risks. Guarantees could be widened to encompass venture capital on both the formal and informal financial markets. Mutual guarantee fund systems could also be developed further, particularly as they allow businesses easier access to micro-finance – that is, loans of less than €25,000.

## Sharing ideas

"It was important that workshop participants contributed actively, presenting what they had experienced in their own country," stresses Christophe Guichard of the European Commission's Directorate-General for Enterprise. "Then they could think about the possibility of transferring measures into their own national contexts."

For example, the state-funded Estonian scheme was developed after collaboration with similar initiatives in the Czech Republic and Romania, developing a handbook of best practice. Another interesting scheme presented at the workshop is a profit-sharing bond offered by Buerges Forderung of Austria, where investors take a share in the borrower's profits, without any appreciation linked to the increase in the company's value, and the bond is guaranteed by Buerges Forderung for ten years.

A number of the specific issues considered by the workshop were raised by a major study prepared for the Commission<sup>(2)</sup> as part of the FIT (Financing for Innovation and Technology) project. This examined 47 existing guarantee mechanisms in Europe, the US and Canada, and posed such questions as how well guarantee

schemes enable financial bodies to fund innovative technology, and how they should be adapted and extended in the future.

## Societies and funds

The two main mechanisms employed in Europe are mutual guarantee societies and guarantee funds. The first developed as private societies in Belgium, Germany, Spain, France and Italy, during the 1920s. These were started by entrepreneurs needing guarantees, who pooled their assets to provide collateral to back their individual credit applications. Publicly-funded mutual guarantee funds are more recent. "Between the two," explains André Douette, Secretary General of the European Mutual Guarantee Association, "there are now various types of company where close co-operation exists between public and private sectors – for example, as public counter-guarantees. The systems vary from country to country, but public and private schemes are complementary."

Often, the decision of a bank to grant funding depends mainly on financial analysis, and less on such 'intangibles' as the character and experience of the borrower, the quality of the management team, and the general climate of business confidence. Young companies, especially in high-tech fields, often require investment several years before they expect to generate revenues. In the absence of a track record, many find it extremely difficult to convince potential investors to offer finance. "This is why, in contrast to regional or national banks, guarantee societies tend to be organised at a local

(1) See also 'Fools, angels and venture capitalists', edition 1/02.

(2) *Guarantee Mechanisms for Financing Innovative Technology*, ISBN 92-894-0787-5, EUR 17041.



## 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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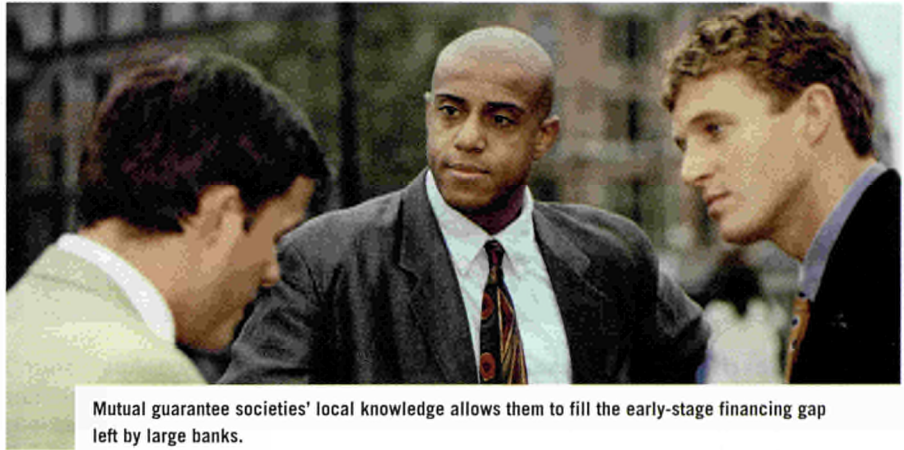
<http://www.cordis.lu/innovation-smes/home.html>

level," Douette explains. "They know the entrepreneurs personally, and can assess the full background, including qualitative aspects."

## Into the future

The rules governing how much capital banks must hold, in proportion to the risks to which they are exposed, are based on the 1988 Basel Agreement<sup>(3)</sup>. The Basel rules are currently being revised, and there is some concern that as a result banks may find small and medium-sized enterprises less attractive as borrowers.

Douette points out that in countries such as Belgium, Ireland and the United Kingdom, banks avoid external guarantors by developing their own methods of evaluating loans. In most other countries banks will continue to depend on formal contracts with guarantee societies. The regulation of guarantee schemes may be increased, but Douette warns that too much tightening could be fatal to the



Mutual guarantee societies' local knowledge allows them to fill the early-stage financing gap left by large banks.

informal and qualitative nature of their business. Although it is very difficult to separate how far guarantee schemes support innovation compared to other activities, he feels that in coming years they will be increasingly important to young innovative companies, especially in candidate countries. ≡

(3) See [http://europa.eu.int/comm/internal\\_market/en/finances/banks/01-15.htm](http://europa.eu.int/comm/internal_market/en/finances/banks/01-15.htm)

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## Company growth



Gate 2 Growth

# Open the door to growth

Gate2Growth.com – a new website to be launched in early April with European Commission backing – is a portal to networks of financiers, company growth experts and service providers.

Gate2Growth.com will offer a complete range of services to help entrepreneurs start, finance and develop their businesses. Its guides, tools and contacts are designed to stimulate a dynamic approach, and stronger business plans. Feedback from potential investors will enable companies to focus on the most promising aspects. Detailed company profiling will help to identify the financial or managerial support needed at each step, and to suggest the best providers.

## Vital contacts

The networks of professionals offering advice and services through the website

as part of the Gate2Growth initiative are:

- I-TecNet – early-stage venture capital funds investing in technology
- ProTon – the European association of university industrial liaison and patent offices
- the Gate2Growth Incubator Forum – professionals in incubator services for start-up companies
- the Gate2Growth Finance Academia – business and management schools from all over Europe

Tools to accelerate investment and increase the visibility of young innovative companies will also be offered. Entrepreneurship training, developed with the European Venture Capital and Private

Equity Association, will be disseminated to European higher education institutions and a twice-yearly 'bootcamp' held with the University of Antwerp Management School. An annual partnering event will help entrepreneurs to meet investors and service providers, and a two-yearly business plan contest will raise standards. ≡

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➤ Technology Transfer

# A market place for innovators

An exciting internet service, relaunched in February, takes visitors to the heart of innovative activity in Europe. The CORDIS Technology Marketplace offers clearly written digests of new technological advances – easy to search, and easy to act upon.

“Since the launch of the pilot service, feedback from users has been positive, with a steady increase in traffic,” says Kurt König, who heads the unit at the European Commission’s Directorate-General for Enterprise that leads the project. “Analysis showed that users wanted to explore the material in depth, and revealed strong demand for multilingual presentation of the technologies. In February this year we launched the operational service in English, French, German, Spanish and Italian. Now we are working on ways to find out how many visitors go on to make contact with technology owners, and what developments result from that.”

CORDIS is an enormous resource, with over 250,000 database records and 30,000 webpages, including both ongoing EU-funded research projects and research results. It is the only public source where such data can be searched by sector, country, region, and even by organisation. But the 11-year old service’s mandate has been steadily adjusted to increase its focus on showcasing emerging technologies with the potential for further exploitation.

## From virtual market...

“There were three steps to creating the new Marketplace,” explains König’s colleague, Irja Vounakis. “First, we worked on improving the data, sifting it for viability and credibility, presenting it in accessible language and introducing attractive designs. In phase two we identified business, science and society as the main search categories with the key domains being biology and medicine, energy, environment, information



technology, telecommunications and industrial technology. We introduced business tips for small companies and published a bi-monthly magazine, the *CORDIS focus RTD Results Supplement*. Reproducing the best offers from the website, this is distributed to around 40,000 subscribers in Europe and beyond, and is also downloadable in electronic format.”

The aim of the most recent multilingual phase has been to boost service usage through promotion, media features, alerting target user groups and the provision of content to web portals.

## ... to actual benefits

“The Marketplace provides a real interface between the worlds of scientific research and innovative business,” says König. “The new, multilingual site is easy to browse, easy to understand, and offers access to detailed technical descriptions of all research results and activities, suit-

able for a very wide audience. By stimulating interest and supporting the first steps to technology transfer, it contributes directly to the Enterprise Policy objective of promoting the competitiveness of European businesses.”

Environmental and other interest groups, and even individuals, will also benefit from access to new technologies. Many of the technology offers featured in the Marketplace have major societal impact – for example, in the fields of food safety and AIDS. For this reason, the site includes a ‘society’ section, and takes as its slogan “Connecting people with technology”.

Offers are updated weekly and registered users can request email alerts which automatically send new information corresponding to their interests, as soon as it is published on the web. ≡

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The *CORDIS focus RTD Results Supplement* is available at <http://www.cordis.lu/marketplace/supplement.htm>



Corporation Tax

# Grants or tax breaks?

In December, the Industry Council agreed that tax incentives and other indirect support measures are top priorities for stimulating innovation activity in the European Research Area. A new Innovation Policy Study assesses the effectiveness of fiscal tools as part of the policy mix.

The Lisbon European Council of March 2000 identified innovation – the rapid and efficient exploitation of Europe’s world-class scientific and technological knowledge in marketable products and services – as the key to sustainable economic growth.

## Reducing state aid

The 2001 Innovation Scoreboard<sup>(1)</sup> highlights private sector spending on R&D as one of the key areas in which the European Union as a whole does particularly poorly. This reveals “structural weaknesses of the European innovation system”, says the European Commission, which calls on Member States “to initiate or increase incentives” to strengthen business R&D.

“Such incentives can take two forms,” explains Jean-Noël Durvy, head of the Innovation policy unit at the Directorate-General for Enterprise. “Financial incentives represent direct government support for innovation through grants, loans or subsidies. Fiscal incentives are tax relief measures which encourage firms to carry out innovation activities by reducing their cost.”

Each approach has advantages and disadvantages. National governments choose one or the other, or in some cases combine them, in accordance with wider policy objectives (see chart). Financial incentives are more easily targeted, and tend to be used to increase innovative capacity in specific industrial sectors or groups of companies. Fiscal incentives, on the other hand, are used in countries like Spain and Portugal to boost innovative performance across their whole economies.

As forms of ‘state aid’, both fiscal and financial incentives are strictly regulated. “It is important that incentives are not allowed to distort competition, particularly in view of the Community’s commitment to the overall reduction of state aid,” Durvy points out. “There is therefore growing interest in ways to achieve larger improvements in innovative performance with smaller contributions from public funds.”

Since it is notoriously difficult to predict the industries or technologies that will drive future economic growth, grants targeted towards particular sectors are not always the most efficient application of public money. “Because fiscal incentives are normally available to *all* businesses, they have the virtue of allowing the market itself to decide where the greatest opportunities to improve competitiveness lie,” Durvy concludes.

## Patchwork of approaches

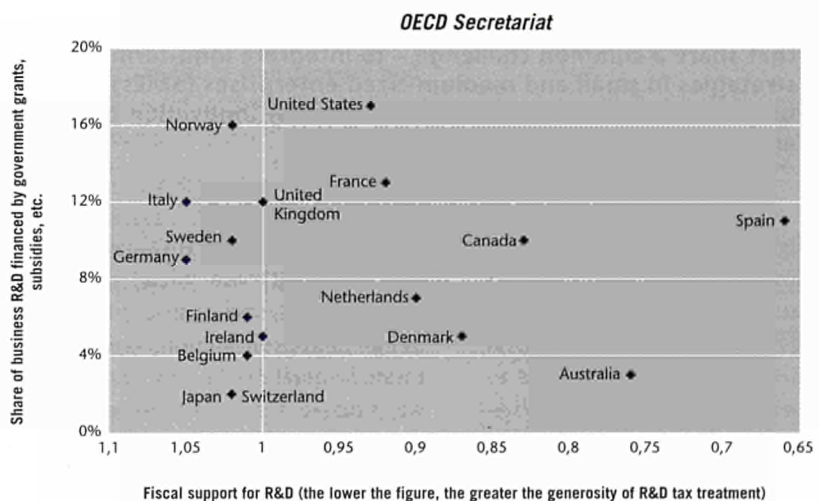
His views echo the findings of a recently published Innovation Policy Study from Enterprise DG<sup>(2)</sup>. Covering incentives both for R&D and for activities such as technology transfer, training and industrial design, the study looks at the range of tax measures applied across the EU in recent years, examining the experiences of France, Germany, Spain, the United Kingdom and the United States in detail. It sets out the evidence for an assessment of the effectiveness and economic impact of each measure, as well as presenting the views of policy-makers and companies.

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(1) See ‘The learning curve’, edition 6/01, and the special edition of October 2001 which contains the main text of the 2001 Innovation Scoreboard.

(2) ‘Corporation tax and innovation: issues at stake and review of European Union experiences in the nineties’; EUR 17035 EN, NB-NA-17035-EN-C.

## Fiscal and direct financial support to business R&D, 1996



There is considerable variety in the balance between grants and tax breaks for R&D struck by individual Member States. While Denmark and the Netherlands favour tax incentives, for example, Italy, Sweden and Germany rely more on direct funding schemes.



The use of fiscal incentives as a means of stimulating research and development, and of strengthening the capacity to innovate, is relatively new. Current practice differs very markedly from one Member State to another, and evidence for the positive impact of such incentives is as yet too limited to be conclusive. But the study provides an authoritative framework for policy-makers to assess the innovation effects of their own national tax regimes, to compare them with those of other European countries, and to begin the process of benchmarking and peer review.



4. Among the possible tax incentives, volume-based schemes – which reward all expenditure on defined innovation activities – are simplest to implement, administer and operate, and are easiest for companies to understand and calculate.

5. If SMEs in particular are to benefit fully from such measures, it is essential that the activities covered by a scheme are clearly, precisely and unambiguously defined, and that there is an adequate support framework to provide information and assistance. ≡

## Key findings

The study concludes that:

1. Tax incentives have significant potential to influence private sector R&D investment decisions, and are a natural policy tool for market-oriented governments wishing to boost innovation expenditure throughout the economy.
2. Governments must tailor fiscal incentives to the strengths and weaknesses of their national industrial fabric. No single

scheme is optimal for all national economies. Inevitably, corporation tax policy involves trade-offs between different policy goals and priorities.

3. Technological innovation crucially involves interlinked activities not encompassed by traditional definitions of R&D. A Community regulatory framework for state aids which encompassed non-R&D innovation activities would contribute to the development of innovative capacity and competitiveness in the EU.

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## ► Innovation Projects

# Cast the net wide



The 'HIT' cluster groups Fifth Framework Programme Innovation projects that share a common challenge – to integrate long-term development strategies in small and medium-sized enterprises (SMEs). One project builds on schemes that have brought a new innovation culture to a small area in Sweden.

HIT (Highlight Innovation Trends) is one of three clusters of projects with similar themes that were launched during 2001, each trying out new concepts for innovation platforms<sup>(1)</sup>. They were formed to help European SMEs improve their strategic capabilities in the face of increasing global competition. Enabling participants to work together and exchange good practice, platforms for co-operation can be established on a permanent basis – and will provide support for future innovation.

"The two key words that describe the essence of HIT are 'broadening' and 'anticipating'," says Francisco Fernandez of the European Commission's Directorate-General for Enterprise. "How do we find more people to contribute actively to a project? How can we optimise their work together? What kind of problems can they tackle as a team? How do we develop competencies? In addition, how do we help today's companies prepare to exploit opportunities that will

be offered by new technologies emerging over the next five to 20 years?"

## Numbers, not names

One of the eight projects<sup>(2)</sup> in the HIT cluster is Regional Competence. Its ten-member consortium is led by the Trade Union Confederation of the Swedish province of Blekinge, and involves SMEs, trade unions, universities, municipal authorities and regional development



Some of the HIT partners at an initial meeting last year in Gothenburg. From left: Hans-Olof Månsson (Samuraj Data AB), Elisabeth Rosengren (BTH), Erik Modic (municipality of Komen), Walter Wenzel (CEMR) and Hans Lindgren (BTH).

agencies. Their primary aim is to adapt and test new tools for the verification, validation and development of competence at individual, company and regional levels.

"The main step we took was to find a meaningful approach to computerising employees' life and career histories," explains Sterne Johannesson, Trade Union Officer for the Blekinge region. "Confidential personal details remain under restricted access on the intranet of the employee's organisation. But aggregated data are made available via an internet-based open source programme to companies and institutions throughout the region."

The system allows individual competencies to be pooled as related resources. This not only enhances co-operation between local companies, but also enables local authorities to establish strategic plans – for continuous adult education, for example. "The practical benefits can be illustrated by something that happened shortly before the system became operational," Johannesson explains. "The production machinery at a local SME employing 15 people broke down. The plant had to shut down while they waited three weeks for a technician to come all the way from Munich to repair it. Someone in the neighbourhood recognised the technician – he happened to have worked with him in Germany some years previously. It turned out that this local worker had the same training, and could have fixed the damaged machinery. We realised that if our regional competence network had been up and running, we

could have identified him immediately – and spared that company three weeks lost production."

In fact, the database network in Blekinge has been evolving for over four years. More than 900 organisations, large and small, are now involved. This is a heavily industrialised region, with large telecommunications companies and a technical university, so the advantages offered by these networks became immediately apparent at the outset. Pilot projects have now been conducted in ten other communities throughout Sweden, and the programme is also being exported to areas of Italy, Slovenia and Spain.

### Fruitful meeting

The first meeting of project co-ordinators in the HIT cluster took place in Luxembourg in November 2001 – and considered, among others, the issues of innovation culture, and data transparency and privacy, addressed by the Regional Competence project.

One of the objectives was to create new clusters between the different projects. "We discovered potential for mutually beneficial synergies with a municipal project based in Valladolid, Spain, co-ordinated by a defence industry organisation from the UK," says Johannesson. "We realised that our two projects could form a new cluster. Although their project is more high-tech than ours, we found that we could profitably incorporate their software, which is designed to help SMEs plan strategically for the future in a detailed way."

If a company has a three-year plan to reach the market place with a new product, the software helps it to establish the necessary internal structures and strategies for the employees involved. "We want to develop a programme that would show how each employee, and the company as a whole, is progressing at any given time, so that any necessary corrective action can be taken early," explains Johannesson. In turn, the members of the Valladolid team may also benefit from the experience of the Regional Competence project. "The big advantage for them is our method for facilitating co-operation between large companies and the SMEs whose expertise they require." ≡

(1) See also 'Action learning', edition 6/01, and 'Net works', edition 1/02.

(2) The others are Esplanade, Iprodoc, Team, Changes, Eim-Cee, Basis, and It Takes Two.

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► Leather Footwear

# Salmon-skin shoes



Salmon-skin shoe produced by Dario Burchelli, from the footwear manufacturer Calzaturificio Santa Maria. Dario Cerretti is a trademark.

When the two-year CRAFT project<sup>(1)</sup> to improve pickling and tanning methods for waste salmon skins finished in November 2000, the whole transnational project consortium was delighted with the results. But though this product had clear potential in an industry already familiar with crocodile and snake skins, the true market position of *cuir de mer* still needed to be established. Now, the picture is becoming clearer.

Hundreds of pairs of shoes were made up in the new material, in a variety of styles and colours, and samples were shown for the first time at the Italian leather fair in May 2001. "The level of interest was amazing," reports the co-ordinator, Enrique Montiel of INESCOP, the Spanish Footwear and Leather Institute. As a result, several agreements have been reached between the original SME partners and firms in Spain, Italy, France and even Chile, to take the skins into mainstream use.

"Fashion is terribly important in footwear, and changes on a four-monthly cycle," Montiel explains. "The industry has to be predictive, trying to guess what will be the 'in thing' ahead of product manufacture." There is also a degree of reactivity, and interest has been stimulated by recent resurgence in the popularity of reptile skins. It will probably take another 18 months before salmon leather

When co-operative research produced a way of turning waste skins into high-quality leather, all that remained was to see whether it could be made commercially successful. With ongoing co-operation and a strong approach to the market, it seems that it can.

finds its own niche and its true market share becomes apparent. "We have done all we can for the moment," say Montiel and the project's technical leader, his colleague Vicente Segarra. "Now we must wait to see how much uptake there is."

## Benefits all round

Shoe manufacturing accounts for 80% of Europe's leather. Plastics and textiles are also well-established materials, so market entry for new materials is not easy to achieve. Salmon leather is unlikely to create a large industry – it takes two fish to make the leather for just one shoe, which rules out mass production. But it enables salmon producers to extract value from waste, gives tanners a new product, and provides shoe manufacturers with a new material combining the advantages of high quality and attractive price.

There are also environmental gains. The process more than halves water consumption and offers a dramatic reduction in the use of chemicals like amines, sulphur compounds and salt, compared with traditional methods. The project has also partially addressed well-known industry problems like those associated with solvents and chromium, which are used in the general tanning process. Alternative, water-based, finishing techniques are being developed but, as Montiel says,

the whole thing is consumer-driven and final appearance is the crucial factor. As the leather manufacturers involved in the project, such as Tomas Sierras of Tradelda, know, for the moment there are strong pressures to stay with established methods.

Clearly, it is too early to gauge the long-term economic benefits. But Montiel points out that the original consortium has now been joined by ten more companies eager to help in the commercialisation of its results. "If this is anything to go by, there will be plenty of interest in the market. It is a good product and will find its place." ☰

(1) Project BRST985514 – Salmon skin tanning.

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➤ Economic and Technological Intelligence

# Contact points strike sparks

The European Union's 18 million small and medium-sized enterprises (SMEs) already account for 66% of total employment and 55% of turnover, and need all the help they can get to develop – especially through technological innovation.



Exchange of expertise. "Germany is especially strong on websites, Austria excels at databases, and the UK has a lot of experience with helplines," says Rachel Fletcher.



An important source of support is the network of National Contact Points (NCPs) established to encourage SMEs to participate in EU Framework Programme research. A recently completed Economic and Technological Intelligence project has done much to strengthen this provision. With plans for the Sixth Research Framework Programme (FP6) including an increase to 15% in the share of project funding earmarked for SMEs, its effectiveness will be critical.

## Generation game

The Transnational training and accreditation (Transtracc) project, undertaken by 15 SME NCPs between May 2000 and September 2001, focused on improving support activities and networking skills.

Co-ordinated by Beta Technology, which hosts the British SME NCP, the project also involved NCPs from Austria (BIT), Germany (AiF), Italy (APRE), Sweden (EU R&D Council), Spain (Inasmet), the Netherlands (Senter/EG Liaison) and Belgium (Technopol Brussels). Newer associates were also involved, from Estonia (Archimedes Foundation), Greece (EOM-MEX SA), Latvia (Latvian Technological

Centre), Lithuania (Mokslo Science and Technology Park), Iceland (RANNIS – Iceland Research Council), Cyprus (RTD Talos), and the Czech Republic (Technology Centre AS).

Transtracc not only helped to transfer experience and skills from experts to newcomer organisations, but also led to the production of a booklet, *In Search of Excellence*. This offers sound, cost- and time-saving ideas for any contact point organisation, and considers the requirements for administration, internal and external training, and management. It highlights the importance of creating an informative and user-friendly website offering SME registration, partner search facilities and document downloads. It also urges NCPs to establish their own regional or sectoral networks of intermediary experts to help them reach groups of SMEs in particular niches.

Emphasis is placed on network co-ordination, and on the exchange of experience between NCPs through training and feedback sessions. The guide proposes an NCP checklist which includes simple but easily overlooked tasks such as verifying SMEs' eligibility for research funding, and monitoring project benefits. It emphasises that

a free and confidential telephone helpline in working hours is the most important service for SMEs needing support.

## Numbers up

Implementation of these recommendations has been piloted with the Cyprus NCP, where they have produced a very positive response. "The project has been a valuable experience, leading to real changes in our organisation," says Dr Alexandros Michaelides, CEO of RTD Talos, who notes an increase in interest and in the number of enquiries received. He says that establishing standards for operation and procedures is helping to maintain the required quality of service.

"We are now keen to do a further, more advanced project," says Beta Technology's Rachel Fletcher. "Working together provides a mix of strengths as well as excellent feedback, and has helped immeasurably in the challenge of searching for transnational research partners." ≡

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*In Search of Excellence* can be downloaded from  
 http://www.bit.ac.at/Transtracc\_Guide.pdf



## Technology Partnering

# On-line business matchmaker



CORDIS is supporting candidate countries' integration into Europe's innovation system.

The CORDIS service is a well-established source of information about European research and innovation. Now it is starting to win a reputation as a means of identifying new business opportunities – as a new contract between companies in Greece and Bulgaria illustrates.

The companies that 'met' on-line are the Bulgarian Business Innovation Centre-IZOT Co and Paragon Ltd of Athens, in Greece. IZOT evolved from Bulgaria's Central Institute of Computing Technique and Technologies and is now an umbrella for 140 SMEs in the field of electronics. It has developed a cryptographic system to safeguard the security of information on personal computers, which it wants to market abroad. Under the new contract, Paragon represents the ciphering-deciphering system – which won a gold medal at the 2001 International Technical Fair at Plovdiv, Bulgaria – to companies in Greece, Italy, Cyprus and Israel.

## Partnering

CORDIS (the Community Research and Development Information Service) is a free service of the European Commission. Set up to cover Community research programmes, it now has sections specially designed to assist small and medium-sized enterprises (SMEs) with innovation.

The Bulgarian and Greek companies found each other through the CORDIS Partners service. "With its specific interface for potential partners from the candidate countries, CORDIS provided us with real chances to open up new markets for our company," says Dr Ivan Kurtev of IZOT. "Less than two months

after we put our offer on the Partners database, we made on-line contact with Paragon. This virtual partnership has now become a reality with the signing of the contract."

Paragon is a high-tech company specialising in engineering solutions in noise and vibration control, rational use of energy and optimisation of industrial production processes, as well as technology transfer from universities and research institutes to industry. Paragon's Dimitri Manolas is equally enthusiastic about the potential of CORDIS. "We have been using the service since the company was founded in 1994," he says. "It has enabled us to find numerous research partners with ideas that matched our background, helping us to expand our international collaboration." Paragon has been involved in more than ten projects and thematic networks in the Fifth Research Framework Programme.

Manolas was nevertheless surprised to receive the offer from IZOT. "We contacted them and found that they had an excellent product for our established markets, so we could go straight to a marketing agreement without any further development. This showed us the value of CORDIS as a support tool not just for doing research but also for doing business in Europe."

## Virtually essential

The Bulgarian-Greek deal illustrates the potential of CORDIS to broker technology transfers across EU borders, and in particular to support the integration of candidate countries into Europe's innovation market.

CORDIS also provides regional Innovation Relay Centres (IRCs) – which play a vital intermediary role in helping local companies to find international partners – with on-line access to the best of European and national research results. The IRCs are among the most active users of the virtual Technology Marketplace<sup>(1)</sup>. ≡

(1) See this edition, page 16.

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➤ IRC Annual Meeting

## Regional innovation catalysts

The Innovation Relay Centre network has hit the ground running in its third major phase of operation. As a conduit for new knowledge to enterprises in every corner of Europe, it performs a vital function in Europe's innovation system – and will play a key role in the Sixth Research Framework Programme.

These were among the main political messages articulated at the IRC network's annual meeting, held in Marseille last October. Professional innovation brokers from the 225 IRC offices throughout the European Union and the candidate countries spent most of the three-day conference addressing strategic or technical issues in practical workshops, or planning specific initiatives in bilateral meetings. But they also found time to listen to representatives from the Directorate-General for Enterprise, who placed the network's achievements and plans in the context of the European Commission's present and future policy concerns.

### 100,000 client companies

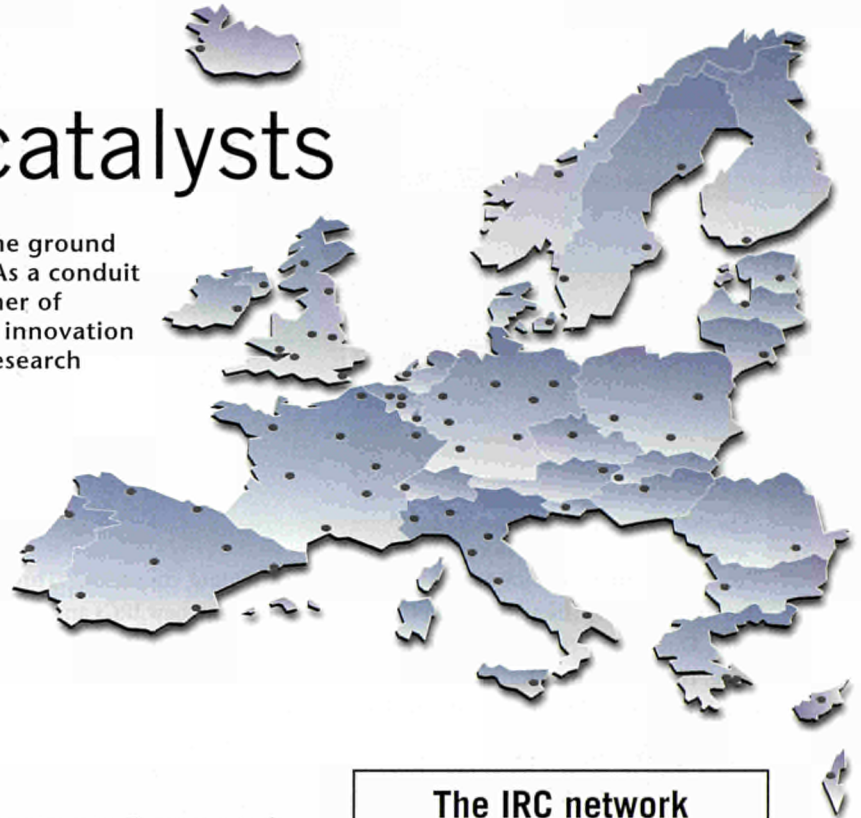
It is by delivering Europe-wide know-how locally that the IRC network helps small and medium-sized enterprises (SMEs) and

others to convert new European technologies into marketable products and improved productivity. "Regional innovation interfaces are particularly effective in speeding the flow of innovation to enterprises of all sizes throughout Europe," said Heinz Zourek, Enterprise DG's Deputy Director-General. "This is a very high policy priority for the Commission, and we rely on the IRCs as key catalysts of this process."

Already, in the year to March 2001, the network served a client base of nearly 100,000 technology-oriented companies and research organisations, and provided direct assistance to 14,000, reported Javier Hernández-Ros, who heads the Enterprise DG unit responsible for the IRC network. IRC clients had concluded a total of 275 transnational technology transfer agreements as a result of this support – an increase of 25% on the previous year (see chart). "It is the network's pan-European coverage that enables it to deliver technological solutions that would otherwise be beyond the reach of most SMEs in particular." But in an increasing number of cases, assistance is provided in the form of personal, face-to-face contact. This makes clear the crucial importance of the network's regional and local presence.



Heinz Zourek of Enterprise DG (right) presenting the Best IRC Award 2001 to Peter Wolfmeyer, Director of IRC North Rhine-Westphalia.



### The IRC network in brief

The Innovation and SMEs Programme's network of 68 Innovation Relay Centres (IRCs) spans 30 countries, including the EU Member States and the Newly Associated Countries (NAC).

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://irc.cordis.lu/>

### Greater visibility

Looking forward to FP6, Hernández-Ros said that new collaborations with Eureka, the European Space Agency, and in particular the thematic research programmes of FP5<sup>(1)</sup>, were strengthening the network's position as an indispensable component of the European innovation service infrastructure. "The IRCs are 'in' – and with an important role to play in

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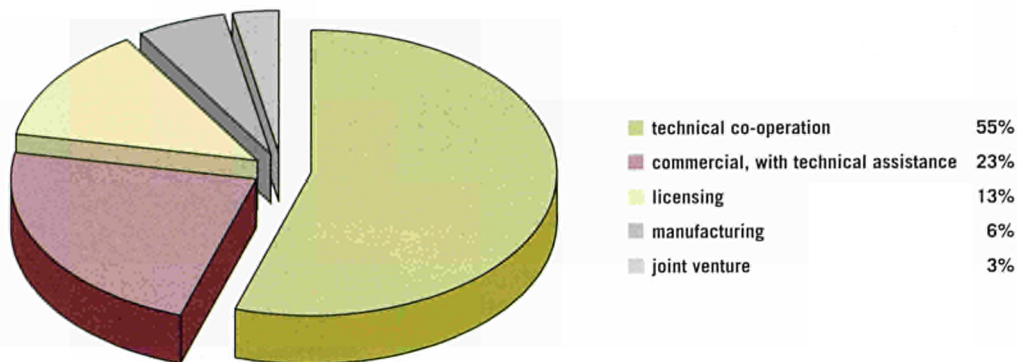
(1) See this edition, page 26.



## Transnational technology transfer agreements brokered by the IRC network

April 2000-March 2001, by type

IRC-IRE Central Unit



FP6's 'Structuring the European Research Area' programme," he said. Giulio Cesare Grata, Director of the Innovation Directorate, confirmed that innovation would have increased political visibility in FP6.

Other 'behind the scenes' changes involve the planned rationalisation of the Community's various business support networks<sup>(2)</sup>. This is essential as a means of highlighting their European added value, and to make it easier for firms to identify and access the specific service they need, Zourek told the IRC delegates. During 2002, the Commission plans to introduce a common corporate identity for the IRC, Euro-Info Centre (EIC) and Business and Innovation Centre (BIC) networks, a shared web portal, and a basic package of common services including efficient signposting between the three. The aim is not to merge these service networks, but to realise the potential synergies between them, he said.

### Extending innovation

A second political priority directly addressed by the IRC network is EU enlargement. "We have to be realistic," cautions Yannis Tsilibaris, Head of Sector in the Networks and services unit. "The work of the IRCs is just one component of the Innovation programme's contribution to enlargement, which is itself a relatively small part of the wider process."

Nevertheless, it is clear that technology brokerage is critical for the development of a sustainable innovation culture in the

candidate countries. "Through the network, the new IRCs and their clients gain access to the EU's enormous pool of know-how and technology, and to new opportunities for the exploitation of their own research results," says Tsilibaris. "In the ten central and eastern European countries (CEECs), the establishment of professional innovation brokerage capacity is an important element in the alignment of their national innovation systems with those of the EU." And the new technology partnerships which the network is helping to forge between their young and fragile high-tech communities and research institutions, technology suppliers and potential clients in the EU are of a value which it is hard to measure in terms of completed technology transfer agreements alone.

Already, the 13 IRCs from candidate countries account for 12% of the technology offers distributed through the network's intranet, and for 20% of the technology requests. "Considering the scale of the problems of industrial restructuring, this is an amazing achievement," Tsilibaris points out. But he does not underestimate the challenges ahead. The network's own recent strategic study<sup>(3)</sup> identified 'innovation dissemination deficits' in all ten CEECs, with the IRCs struggling to overcome low levels of demand for transnational technology transfer services. "It will take time. But building a truly pan-European network is a necessary step in the extension of the European market in technological innovation. And this can only come about

through committed, continuous, day-to-day collaboration between IRC staff in the Member States and their colleagues in candidate countries."

### Peer recognition

The annual meeting included for the first time the award of prizes to individual IRCs – not by the Commission, but by the network itself. Awards were made on the basis of voting by IRC staff for outstanding performance in three categories. The prize for best transnational technology transfer was given to IRC Northern Ireland and IRC Norway for their brokerage of a two-way exchange of welding know-how<sup>(4)</sup>. IRC Austria won the prize for best contribution to network development, for the automated on-line technology profile matching system, TechTrans<sup>(5)</sup>. And the proud winner of the best IRC award for 2001 was IRC North Rhine-Westphalia.

(2) See 'Continuous Improvement', edition 4/01.

(3) See 'If the IRC network did not exist...', edition 6/01.

(4) See 'Defeating the Oil Tanker's Enemy Within', edition 4/01.

(5) See 'One-Minute Technology Transfer', edition 6/00.

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➤ Furniture Making

# A flexible friend

Through the Innovation Relay Centre network, IRC Bulgaria has found a Swedish technology partner for a local firm, enabling them to solve a manufacturing process headache and retain a lucrative contract.

Bulgaria's transition from a centrally planned economy to the fiercely competitive environment of the free market has not been easy. To survive, companies must learn to develop or acquire new technologies in order to upgrade inefficient manufacturing processes.

Outside help has been required, much of it from western Europe. IRC Bulgaria, established in 1997 and hosted by the national Applied Research and Communications Fund (ARCF), is proving invaluable as an intermediary. Working with IRCs in the west, it has already helped a number of clients to reach agreements for the acquisition of technologies from EU Member States.

## Cracking up

"Fairly early on we identified 100 companies which we felt could particularly benefit from the IRC's transnational technology transfer service, and carried out a mailshot to explain our mission," recalls project officer Angel Milev.

One of the responses was from Kalina Miteva, general manager of Ludogorie 91, a 250-employee manufacturer of wooden furniture in Kubrat, in the north-east of Bulgaria. "The company had won a prestigious contract from IKEA to supply wooden dining chairs, but was finding it hard to produce the shaped rear legs," Milev explains. Normally, the required profile would be produced by contour cutting, but this is both wasteful and time-consuming, and the company needed to reduce costs. It had built a

machine to bend the legs into shape, but the wood often cracked. Adjusting temperature, pressure and time settings failed to bring reject rates down to an acceptable level.

"When Ms Miteva contacted us, we soon realised that the know-how needed would not be available in Bulgaria," Milev says. Just ten days later, IRC expert Krasimir Cholakov travelled to Kubrat to carry out a full technology audit of the company's factory, and helped staff to formulate a technology request. "We entered the request in the database on the IRC network's intranet, where it was picked up by Rolf Olsson at IRC Northern Sweden," Milev continues. "Using his contacts in the wood industry he located Ola Hugosson of Palskog Innovation, and luckily he was keen to help." Satisfied with the Swedish company's suitability, the two IRCs arranged for Mr Hugosson to visit Ludogorie 91 in February last year.

## Ever-present

With Olsson and Milev both on hand to interpret, Hugosson diagnosed the problem, and proposed a new design of hydraulic mould – actually quite a complex challenge. "You can imagine the stresses involved in bending a 50 mm sheet of beech wood," says Milev. "But he was confident he had the answer, and Ludogorie 91 had faith in him."

Next, the IRCs helped the partners to draw up technology transfer agreements, under which Palskog would design and supply new components for the hydraulic



The finished product – stacks of chair legs awaiting assembly in the Bulgarian factory.

press. A month later, these were fitted and the chair legs could be successfully shaped, without cracking. The factory has reduced waste by 15% and cut processing times by a third. Ludogorie 91 has significantly improved its margins, and has now placed an order for a second press. "We are delighted with the IRC's contribution to safeguarding jobs in a region that cannot afford to lose them," says Milev. ≡

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► IRC Public Website

# Innovation by internet

A clear, straightforward interface helps to explain the IRC service, and how firms can access specialist help to meet their innovation and technology needs.

"Finding really useful content among the huge amount available is a big problem for small and medium-sized enterprises in particular," says Eric Chataigné of the IRC-IRE Central Unit, who developed the new site. It has been designed to meet the particular needs of technology-oriented SMEs, especially those wishing to establish transnational partnerships. It offers examples of transnational technology transfer successes, details of brokerage events, and ground-breaking technology offers.

The IRC network's unique feature is its combination of local presence and transnational reach. With 68 IRCs and almost 250 regional offices, few SMEs are far from expert assistance, a point made strongly by the new site. "Contact is made locally, because the service is local," explains Chataigné. "Innovation actors need to know that this is something concrete they can rely on." To support the network, the website has been structured to ensure that data is always current. The new site is built on a dynamic database linked to the network's own intranet. New non-confidential information posted by individual IRCs – about forthcoming events, for example – can now also be made available directly on the public website.

The internet provides access to enormous amounts of information, but this can be confusing for firms looking for help with innovation or technology transfer. The new public website of the Innovation Relay Centre (IRC) network makes the process easy, offering well thought-out guidance.

## Adding value

Individual IRCs have themselves developed what Chataigné describes as "a constellation of websites doing the same job". The challenge is not to control but to coordinate them. "The system is organised, but not centralised," he explains. "With the help of network members, we have tried to focus on common areas, rather like a 'web-ring' or 'portal' model."

This is an idea which may be developed further in future. Chataigné sees the website as an important addition to the range of network tools, all of which are designed to add value to the service delivered by individual IRCs to their local clients. It could, for example, be used to promote the thematic groups formed by groups of IRCs with shared interests in particular technological fields such as aerospace, nano- and microtechnology and materials, helping them to arrange regular face-to-face and on-line meetings as well as technology brokerage events.

The site has been well thought out to provide users with easy access to information. Whether a visitor wants to acquire a technology, or to exploit one through a strategic partnership, all the necessary information – contact details, issues to be considered, the next step – is readily

available. Firms can quickly see the benefits and how to make use of the IRCs' transnational service. Chataigné is confident that the site will further strengthen "the largest and most successful technology transfer network in Europe".

## Collaboration with CORDIS

The new site aims to act as a gateway to both web-based and physical resources, but Chataigné is quick to point out that this stays under the CORDIS umbrella. In fact, the site's 'showroom' for new technologies is managed in collaboration with the CORDIS Technology Marketplace<sup>(1)</sup>.

(1) See this edition, page 16.

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Small-Scale Hydropower

# Renewable synergy

The IRC network has helped companies in Finland and Germany to harness previously unexploited renewable energy by combining compact hydro-turbine technology with power-plant expertise.

For some years the Fulda river, in the Hessian region of Germany, has been controlled to maintain a two-metre difference in water levels for nine months each year. But until now, this opportunity for hydropower generation has been lost, as the shallow elevation is unsuitable for conventional turbines.

The Finnish company Waterpumps WP Oy has developed submersible compact turbine generators which overcome this limitation. Sited underground, the system monitors upstream water level and selects the best turbine combination to maximise output. The technology fits perfectly with the power-plant expertise of German engineers Henkel, Rotzsche und Bard, and the two companies have joined forces to harvest the Fulda's energy resources.

## New capacity

They had already identified one another as potential partners. But nothing came of the contact until Hannu Juuso of the Innovation Relay Centre Finland got in touch with colleagues at IRC Hessen/Rheinland-Pfalz. "Together, we brought representatives of the German firm to Finland," Juuso explains. "IRC Hessen/Rheinland-Pfalz covered travel costs and we organised a programme of visits to power plants." With both IRCs assisting in negotiations, the visit led to a plan to install two mini-hydro power plants with 15 specially built compact turbine generators.

With a capacity of around 1,000 kW, the plants will not only increase the share of renewable energy but significantly boost the prospects of the two companies. With few fossil fuel resources, Finland has a thriving alternative energy industry, which accounts for 30% of the country's electricity and offers excellent market opportunities for renewable technologies. "Waterpumps WP Oy has installed over 50 compact turbine generators in Finland, Estonia, Sweden, Switzerland and the UK, and the German project further extends its market through technology co-operation," says Juuso.

## Competitive advantage

As power-plant specialists, Henkel, Rotzsche und Bard has gained a technology that can be incorporated in future designs. "This makes it more attractive to potential clients and enables it to identify many more viable hydro-power sites," says Raimund Bröchler of IRC Hessen/Rheinland-Pfalz.

Waterpumps WP Oy is providing theoretical and practical training to Henkel, Rotzsche und Bard employees, ensuring that skill and knowledge is transferred, as well as technology. For the Finnish company, the project has opened up not just a market in Germany but a whole new area of application in shallow elevation hydro-power, and it has established a new firm to carry out commissioning and maintenance.



Commissioning of submersible compact turbine generators, similar to those that will be installed on the river Fulda during 2002.

"The project is a good example of the IRC network's growing maturity," says Bröchler. "IRC's are no longer just looking for new technology transfer clients. They now have strong relationships with established clients, whose needs they understand and for whom they can rapidly identify opportunities and partners." For more and more European enterprises, partnership with their regional IRC is a source of real competitive advantage. ≡

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## ➤ Innovation Cells and the IRC Network

# A perfect fit



Professor Peter Meyer of the Leeds Institute for Plant Biotechnology and Agriculture at Biotechnica, explaining his research results in an interview for the German TV programme *Zukunft & Technik*.

Collaboration with the Innovation Relay Centre network is helping the innovation cells of the Framework Programme's specific programmes to fulfil their remit – which is not only to disseminate research results, but to maximise opportunities for their exploitation in the market place.

The Fifth Research Framework Programme gave its specific programmes explicit responsibility for increasing the economic impacts of European research. Each project was required to prepare a credible technology implementation plan, or TIP<sup>(1)</sup>, explaining how the partners would exploit their results – either directly, or through the transfer of know-how or technology to third parties. The implementation of these plans was to be monitored and supported by Innovation Cells within each specific programme.

### Not as easy as it looks

The task given to the Innovation Cells was perhaps a larger one than had been anticipated. The dissemination of research results – at conferences and exhibitions, or on-line – is no guarantee of subsequent transfer and take-up of the technologies concerned. Expert support is often needed to bring technology owners and potential users from different countries together, to advise each of them during the negotiation of a deal, and if necessary to access specialist advice on financing or intellectual property issues.

In short, what is needed is a pan-European network of professional innovation brokers, well-connected with one another and with local companies which can make use of the new knowledge emerging from the European's research programmes. Happily, the Innovation Relay Centre (IRC) network is tailor-made for this role, and has already demonstrated its

capacity to deliver concrete transnational transfers of technology in partnership with the Innovation Cells. The first pilot collaborations, carried out during 2001, have proved extremely successful, and larger initiatives seem certain to follow.

### Speed of the essence

In a trial launched by the IRC-IRE Central Unit (CU) at the IRC network's 2000 annual meeting in Florence<sup>(2)</sup>, 13 TIPs with real potential for exploitation, selected by Scientific Officers in the Growth and Information Society Technologies (IST) programmes, were fed to the CU by those programmes' Innovation Cells.

The CU relayed basic information to the IRC closest to each of the projects, which visited the company concerned to identify and overcome obstacles, and to 'translate' its technology offer into commercial terms. In seven cases, difficulties over intellectual property rights have delayed publication of technology offers, but three offers were disseminated across the IRC network via its intranet. One transnational technology transfer agreement has already been concluded as a result, and in at least three further cases, potential partners are still in contact. In a similar action with the Quality of Life (QoL) programme, 14 research results from the Agro-Food key action have produced eight technology offers.

"For us, the pilot has been a real success story," says Timo Hallantie of the IST

programme's Innovation Cell. "All six of the projects we put forward benefited from IRC support, with three going on to post technology offers. As a pan-European network of specialised technology brokers, the IRC ICT Thematic Group is a unique resource, which the IST programme is committed to supporting."

More recently, a further 40-50 research results identified by the evaluation and impact (EVIMP) assessment of FP4's Brite-EuRam programme have been passed to the IRC-IRE CU, and are now being processed. The CU's Magda de Carli emphasises that the IRC network also benefits from this kind of collaboration with the Innovation Cells. "EU research is a source of high-quality technology offers for the IRCs and their clients," she says. But she warns that some EVIMP results are now too old for technology transfer to be viable. "Many of these projects have already exploited their results internally, or are no longer interested in transferring them." And of course technological progress is now so rapid that only recent research is likely to produce really attractive offers. "The sooner after the completion of a project that its results are fed to the network, the better," says de Carli.

### As seen on TV

The IRC Biotechnology Thematic Group (BioTG), meanwhile, has been working directly with the Innovation Cell of the QoL programme to support dissemination of results from the Cell Factory key



Professor Claude Muller of the Department of Immunology at the Laboratoire National de Santé in Luxembourg. At Biotechnica, he presented the results of a research project to develop bacterial polyesters as renewable substitutes for polystyrene.

action. In an accompanying measure project, CellExploit, a consortium of BioTG members organised a transnational technology transfer event at the Biotechnica fair in Hanover last October. With the travel expenses of project co-ordinators and non-German firms covered by the project, the event drew 120 participants from 16 countries, and provided an ideal platform for the presentation of results from ten recently completed projects.

"The quality and freshness of the research results made for an attractive catalogue of technology offers, and the travel subsidy definitely helped to boost participation," says Dr-Ing Petra Püchner of the IRC South Germany/Deutsch Schweiz which led the consortium. "But meticulous preparation is the secret of success, as it is for any brokerage event." The QoL's Innovation Cell first identified projects with results that were ready for exploitation, but where an investor, user or development partner was still needed. Those that expressed an interest in taking part were visited by their closest BioTG member IRC and advised on the preparation of their technology offers, which were carefully checked by experienced IRC staff before being published in the event's catalogue.

As a spin-off from the project, short videos about four of the QoL projects, filmed in Hanover, were broadcast several times on a German TV news channel. Püchner's colleague, Professor Peter Niess, believes that TV could offer both an entirely new way of promoting EU research and, for the IRCs, a means of

reaching the huge number of 'late technology adopters' which fall outside the network's traditional client base.

It is still too early to quantify CellExploit's concrete results, but initial indications are very encouraging. The other members of the consortium – the IRCs Saxony/Saxony-Anhalt, East England, Rhône-Alpes/Auvergne and Hessen/Rheinland-Pfalz – have all had positive feedback from participants. Püchner herself reports that the QoL Innovation Cell was delighted with the collaboration, and hopes to extend it in the future. "This was our first opportunity to demonstrate the effectiveness of the IRC network, but the potential is much greater," she says. ≡

(1) See 'A TIP for the Top', edition 2/00.

(2) See 'IRCs – Becoming Indispensable', edition 2/01.

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## Spanish Senate learns of IRCs' work

Last September, Antonio Ramírez of the IRC Southern Europe (SEIRC) was invited to explain the IRC's work, its methods and, in particular, its immediate prospects to the Spanish Senate's Science and Technology Committee.

Ramírez outlined SEIRC's achievements to date, including support for 44 commercial transnational technology transfer deals involving firms in its area. He also emphasised the importance of its participation in the pan-European IRC network and, in response to questions

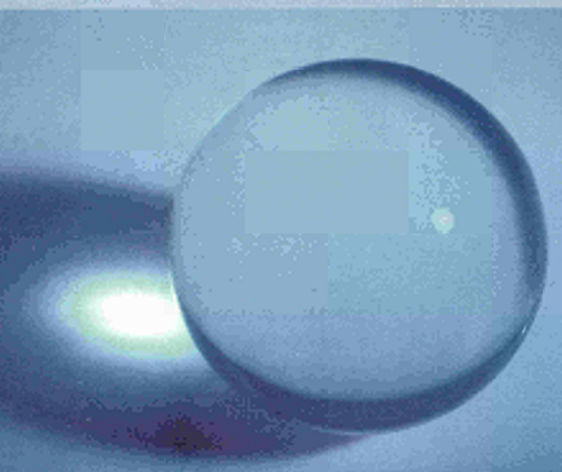


from the committee, explained the coordination of Spain's seven regional IRCs, which is supported by the Ministry of Science and Technology.



Technology Watch

# Keen anticipation



Anticipating significant technological developments becomes ever more critical to business success as the pace of change increases. At an international workshop last November, some of the few organisations offering a technology watch service for SMEs exchanged early experiences.

Representatives from the Innovating Regions in Europe (IRE) network, the Innovation Relay Centre (IRC) network and the European Commission all came to the 'Regional Innovation Observatories and Technology Watch' workshop in Porto, chaired by the IRC-IRE Central Unit (CU).

## Few, but fine

Though both deal with innovation, the IRE and IRC networks have different missions. "The IRE network is composed of regional authorities that develop and implement regional innovation strategies," explains Augusto Ferreira, the CU expert who organised the event. "The IRCs' mission is to assist business communities by promoting technology transfer to companies." Some members of each network are already operating technology watch schemes. With services of this kind only patchily available to small and medium-sized enterprises (SMEs), the time seemed ripe for cross-fertilisation.

While national governments continue to build on a decade of experience with technology foresight – a related anticipatory tool, usually broader in scope and inclined to look further ahead – only a trickle of SMEs and regions are currently following in their footsteps.

Included in this small group are exemplary schemes such as 'Madri+d'<sup>(1)</sup>, which was outlined at the workshop. Ferreira was impressed by its distributed nature. "This is a network of public research centres and non-profit organisations. They have deployed the entire regional innovation infrastructure to answer the technology watch needs of local companies in five industrial sectors – information and communications technologies, energy and environment, microsystems and nanotechnologies, materials and production technologies and biotechnology."

## Synergistic networks

Workshop participants felt that a major obstacle to take-up is that SMEs – even those aware of technology watch – assign a low priority to looking ahead at future technological developments. "They still do not see technology watch as crucial to their present or future success," Ferreira explains. "And since information experts alone are not enough, the relatively high cost of consulting experts in multiple technical fields is also a barrier."

The workshop concluded that public funding is still very much required to sustain technology watch for SMEs. But participants did not think these services should be free of charge. The risk, they

felt, is that a free service would be seen as having little value.

They also believed that IRCs and IREs may be well matched as partners for the provision of a technology watch service. "IRC has a good understanding of key innovation tools like technology assessment, audit and benchmarking, and they know local businesses. IRE network members understand strategy," says Ferreira. "Their functions are synergistic."

With the forthcoming Sixth Research Framework Programme likely to offer new opportunities for projects aimed at anticipating science and technology needs, this synergy may soon be tested in the real world. ☰

(1) 'I&D' is the Spanish equivalent of 'R&D'.

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## Green Week 2002

15-19 April, Brussels (Belgium)

Combining a conference and exhibition programme, this is the second annual Green Week. It addresses the issue of how citizens, businesses, policy-makers, young people and other stakeholders can help to make the world a healthier and more environmentally friendly place to live in. Participants will take part in seminars and workshops addressing children's health and environment, sustainable consumption and production, the world summit on sustainable development and Natura 2002.

### Contact

<http://europa.eu.int/comm/environment/greenweek/2001/index.htm>

## Nanotechnology – the Next Industrial Revolution

24-25 April, Edinburgh  
(United Kingdom)

This event will give entrepreneurs and futurists the chance to explore new business opportunities presented by nanotechnology, and how it is already impacting such products as smart paints, pigments and coatings, personal health diagnostics, retinal, cochlear and neural implants, artificial bone, tissue and organs, and microsatellites. The programme includes case studies of entrepreneurs and industrialists who are currently commercialising nanotechnologies.

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## International One-on-One Co-operation forum for environmental technologies

15-16 May, Munich (Germany)

Organised by IRC Bavaria in parallel with IFAT, the largest European trade fair for environment, this event provides a platform for the establishment of new international business contacts. Participants can choose the companies and institutes they would like to talk to in advance, from a catalogue of the competence profiles and co-operation interests of all participants, including companies from central and eastern Europe.

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## ICT co-operation meeting

3-4 June, Prague (Czech Republic)

Taking place in parallel with the Comnet exhibition and conference, the event will cover electronic business, multimedia and electronic publishing, and telecommunications. It offers participants an opportunity to exchange ideas for technology transfer and establish contacts for future collaboration. The deadline for submitting technology offers and requests, as the basis for arranging bilateral meetings between potential partners, is April 24.

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## The European business summit

6-8 June, Brussels (Belgium)

Organised by the European Union of Employers, UNICE and the Federation of Belgian companies (FEB-VBO), the summit addresses issues affecting the European business community, and will be attended by business people and politicians, including several European Commissioners. One theme will be 'Entrepreneurship and sustainable development in an enlarged Europe', and candidate country representatives will be fully involved in panel discussions, as well as presenting business opportunities in their countries. A dedicated 'exhibition and networking village' will be available to facilitate networking.

### Contact

ebs@vbo-feb.be  
<http://www.ebsummit.org/>

## Integrating European research innovation management

14-15 June, Budapest (Hungary)

The annual conference of the European Association for Research Managers and Administrators (EARMA) is organised this year in co-operation with the Hungarian academy of sciences. It will bring together research managers, administrators and other interested parties to increase the quality and competitiveness of European research through improved research management and administration.

### Contact

<http://www.cineca.it/earma>  
<http://www.szlaki.hu/conferences/earma2002/>

## Third Annual Innovating Regions in Europe network meeting

17-18 June, Stratford-upon-Avon  
(United Kingdom)

This event will bring policy-makers together to reflect on future regional innovation policy. It will provide opportunities for networking, and for discussing issues such as the role of the regions in the European Research Area, European cohesion policy after 2006, and regional innovation strategies in the Newly Associated Countries.

### Contact

<http://www.innovating-regions.org/>

## Towards an integrated infrastructure for measurements

18-19 June, Warsaw (Poland)

The conference will consider recent developments in measurement and testing research in Europe, the challenges and opportunities ahead, and the need to build a common research infrastructure. Aimed at academic and industrial researchers, the event will also be of value to others working in the fields of regulation, standardisation and quality control.

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## CRIS 2002, 'Gaining insight from research information'

29-31 August, Kassel (Germany)

The conference is designed to provide a platform for the exchange of information and best practice and the promotion of scientific discussion. In addition, the organisers hope that networking at the event will stimulate European co-operation.

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## Innovative instruments for raising equity for SMEs in Europe

This report, prepared for Enterprise DG, examines European SMEs' needs in relation to their access to finance. It recommends the introduction of public sector sponsorship to help close the venture gap, as well as a greater role for the European Investment Fund. The authors say that the venture gap affects around 5,000 young, innovative and very high-risk firms with high potential for growth, which are too small to be funded by venture capitalists, due to fixed transaction and monitoring costs. A separate venture capital gap extends to debt and hybrid financing, and affects up to 200,000 firms across a much wider range of ages, sizes, sectors and circumstances. The lack of European investors specialising in this area of SME finance is largely due to the lack of the network economies that would be produced by knowledge sharing and support services for financiers. Both gaps exist to varying extents in all EU Member States, the report suggests, while in the United States they are filled by more developed informal investor activity.

### Contact

The full report is available at  
<http://europa.eu.int/comm/enterprise/entrepreneurship/financing/index.htm>

## Financing SMEs: The European Approach

ISBN 90 5466 491 6; €15; 224pp, FR/EN

The proceedings of the European Conference organised last October by Serge Kubla, Belgian President of the Industry Council of the European Union, have been published in a combined French and English edition. The report contains the full text of all the main speeches

delivered at the event, as well as summaries of the discussions. It also sets out the conclusions, which were submitted directly to the Industry Council, and address issues such as taxation, guarantees and entrepreneurial climate. On Community policy, the conference called for a greater focus on market failure, particularly in the area of micro-finance, and for action to reduce the fragmentation of Europe's financial markets.

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## Global competitiveness report 2001

According to the latest edition of the World Economic Forum's report, Finland has overtaken the United States as the most competitive country in the world. Finland heads the rankings of 75 countries in terms both of current growth and of growth potential over the next five years. This is "evidence of how quickly an economy's prospects can be transformed by strong political institutions, a focus on technology and sound macroeconomic management," the report concludes. Other European countries which score well are Sweden, the Netherlands and the United Kingdom. The report emphasises the importance of innovation in realising the competitive benefits of a knowledge-based economy, highlighting science-based learning, venture capital, improved financial and legal arrangements for new start-ups, and "improved legal tools for intellectual property rights" as key factors.

### Contact

The executive summary of the report is available at  
[http://www.weforum.org/pdf/gcr/ExecSumm\\_Final.pdf](http://www.weforum.org/pdf/gcr/ExecSumm_Final.pdf)

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## Industrial aspects of the information society: business networks and the knowledge-driven economy

ISBN 92 828 8044 3; €43

This empirical study, carried out in Europe and Canada, highlights several problem areas that need to be addressed if European industry is to benefit fully from the networking opportunities offered by the web. SMEs have been especially slow to look for value through knowledge and information sharing, and many still lack ICT skills. Currently, the authors conclude, 90% of all networks rely on grants of one form or another.

### Contact

The report may also be downloaded from  
<http://forum.europa.eu.int/irc/sme/euroinformation/info/data/sme/en/library/biznet1.pdf>

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