

Innovation & Technology Transfer

2/97

Best Practices

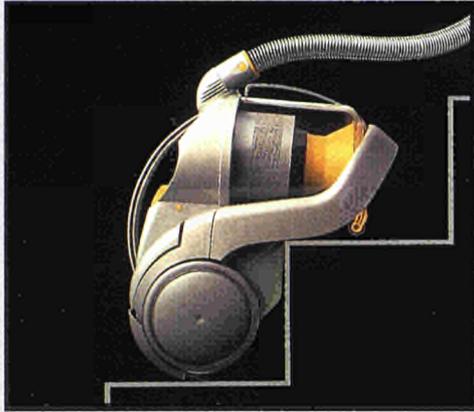
in DESIGN

Plus:

- Financing Innovation
- Restructuring Europe's Aerospace Industry
- ESPRIT Case Study: Removable Hard Discs
- New Innovation Programme Networks



C O N T E N T S



Innovative design from around Europe - see page 10

INNOVATION PROGRAMME NEWS 3-9

Innovation Project Case Study: Coating Processes for SMEs ■ IRC Profile: Bourgogne ■ New Energy Network Launched ■ New Technology Transfer Networks ■ Innovation Financing Studies: Venture Capital and Equity Markets

DOSSIER: BEST PRACTICES IN DESIGN 10-14

POLICY NEWS 15-19

EU-Japan Consumer Electronics Programme ■ Digital Copyright Treaties ■ Future Fusion Research ■ Restructuring Europe's Aerospace Industry

CASE STUDY 20

ESPRIT: Removable Hard Discs

PROGRAMME BRIEFING 21-22

Multilingual Information Society Programme Launched ■ JOULE: Energy/Environment Study

CONFERENCES AND PUBLICATIONS 23-24

Cover: European Service Network. Photo: Paul K

The Power of Design

"Design", remarked Jean-Pierre Raffarin, French minister for SMEs, "is certainly the cheapest innovation management process. The challenge is to integrate design into product development."

He was speaking last January in Paris at the award ceremony of the 1997 European Design Prize, an Innovation Programme initiative designed to promote best practices in design, particularly in sectors where it is not usually seen as a source of competitive edge. The experiences of the 64 finalists, brought together to discuss design as a tool for innovation, make fascinating reading (see Dossier, page 10).

Between them the finalists manufacture products ranging from paper sacks to welding helmets, so the Prize certainly showed that design is being successfully adopted in new sectors in a wide variety of ways. This variety also made generalities impossible to find - as in all aspects of innovation, there are no simple rules to using design.

The most important finding, all agreed, is that designers can only fulfil their potential if they are involved in product development from the beginning. They must understand the customer's needs and have direct access to senior management, who must be aware of how critical design is to their company.

"There is more than one way to improve significantly our capacity to market our technologies," concluded Edith Cresson, European Commissioner for research, education and human resources, at the award ceremony. "Design is one method which remains insufficiently explored. The effective combination of audacity, discipline, creativity and sensitivity to society's needs are the principal ingredients of innovation through which designers can make a decisive contribution."

ABOUT INNOVATION & TECHNOLOGY TRANSFER

Innovation & Technology Transfer is published six times a year in English, French and German by the European Commission's Innovation Programme, which aims to strengthen Europe's innovation infrastructure and disseminate research results to industry.

The emphasis is on timely news relevant to these objectives and in-depth 'Case Studies' of successful projects. Each issue also includes a major Dossier on one topic. Subscription is free - please fill out the request form on the back page and fax or post it back to DG XIII/D-2.

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Dissemination and Exploitation of RTD Results,
Technology Transfer and Innovation

Address

DG XIII/D-2, EUFO 2291, L-2920 Luxembourg
Fax: +352 4301 32084

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► CASE STUDY: INNOVATION PROJECT

Spreading Hi-Tech Coatings to SMEs

Plasma-deposited coatings are used for applications as diverse as medical implants and plastic moulds. Demand is exploding, but process costs have so far excluded small companies from this lucrative market. A new Innovation Project is set to change all that.

The vapour deposition alloy coating process was first developed in the mid-1970s. Since then, it has progressively replaced chromium coating across a wide range of industrial and medical applications. Artificial joints, surgical instruments, and machine tools are among the products which benefit from the technique.

Producing a surface ten times harder than the hardest metal, these alloy coatings are employed wherever low friction, or protection from wear or corrosion are called for. They are also widely used in aluminium press tools and plastic moulds, where they prevent sticking.

Demand for coating is growing rapidly, however costs are high. Specialist coating companies have sought to reduce their prices by building larger systems. But according to Manuel Braun of the Kungliga Tekniska Högskolan (KTH) in Stockholm, who initiated and now leads the project, the real answer is not size, but speed.

"Today's systems operate in batch mode," he explains. "Deposition takes place in a vacuum, and that makes the process very slow. Typically, each cycle lasts five hours. For each batch of products, it takes around three hours to pump the deposition chamber down to the required pressure. That is why they want bigger and bigger systems. But we are convinced that the next logical step in the development of this technique is for manufacturers to do the coat-



SMEs will be able to apply vapour deposition coating technologies in-house for a wide variety of uses, such as surgical tools.

ing in-house, incorporating the process into their own production lines."

An Accessible Technology

Existing users are likely to welcome the opportunity to take the work in-house. But Professor Braun believes that the availability of reliable and cost-effective coating equipment will also attract many SMEs which currently make no use of the technology at all.

"There is considerable latent demand," he says. "In-house coating will be cheaper. It will also cut transportation costs and help to preserve confidentiality. And smaller companies will gain access to a technology which enables them to increase their current prices by up to 50% by improving their products."

The Innovation Project, which entered its 3-year demonstration phase in November 1996,

will create a small, fully automated coating system, capable of non-stop operation. The partners plan to reduce the length of the coating cycle by more than 90%, to around 20 minutes, opening up the possibility of continuous production.

This will be achieved by maintaining the vacuum in the deposition chamber, avoiding lengthy pumping down between cycles. Racked products will be loaded into a primary chamber, whose pressure will be reduced as they are heated and cleaned. After less than 20 minutes, as soon as the previous cycle has been completed, valves will open to allow the new load to enter the deposition chamber, and the coated products to pass into a third chamber for cooling and unloading.

Professor Braun, whose coating expertise is commercial as well as academic, admits that the technology itself ●●●

THE INNOVATION PROGRAMME IN BRIEF

The Innovation Programme implements the Third of the four Activities of the Fourth Framework Programme (1994-1998). Run by DG XIII/D, the Innovation Programme encourages the exchange of research information and the absorption of new technologies by European companies.

Contact

- Unit D-1: Technology transfer and validation projects, JRC liaison, intellectual property
Fax: +352 4301 34129
- Unit D-2: Community Information and Dissemination Service
Fax: +352 4301 34989
- Unit D-3: Relay Centres and other services
Fax: +352 4301 34129
- Unit D-4: Innovation policy, regional aspects, financing, EIMS
Fax: +352 4301 34544

Innovation Home Page
<http://www.cordis.lu/innovation/home.html>

Contact

- M. Braun, KTH
Tel. +46 8 161 060
Fx. +46 8 158 674
- M. Schmiemann, DGXIII/D-1
Tel. +352 4301 33353
Fx. +352 4301 34129

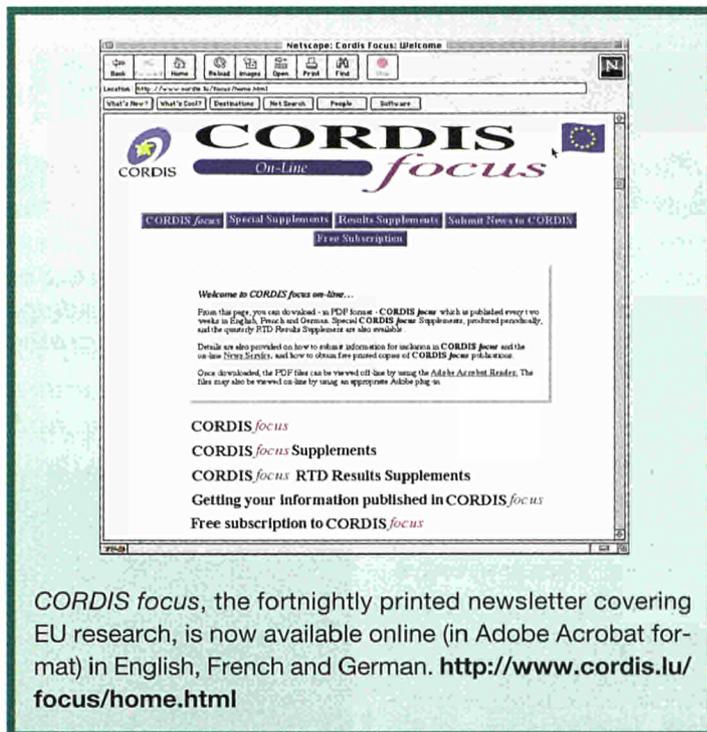
●●● is not new. "The planned deposition techniques are well known," he says, "and vacuum interlock systems are widely used in the semiconductor industry. Our system's unique feature will be the high rate of throughput made possible by combining these two technologies."

New Company

KTH itself will develop and build the main chamber and the positioning unit, and will coordinate the project, while a local Swedish firm will build the transport and interlock system. The sophisticated computer controls needed so that un-

skilled operators can produce consistent, high-quality results will be developed by a small Dresden-based coating specialist. In the project's final phase, a second German company will conduct industrial tests on end-user applications.

It is too early to be certain how the system will be commercialised, but Professor Braun's preferred strategy is for the partners to exploit the results directly. "Our plan is to form a new company, to market the product jointly to our existing customer base," he says. □



CORDIS focus, the fortnightly printed newsletter covering EU research, is now available online (in Adobe Acrobat format) in English, French and German. <http://www.cordis.lu/focus/home.html>

► CASE STUDY: INNOVATION RELAY CENTRE

Tapping the Potential of Local Industry

In central France, the car industry is a major source of innovation and employment. By helping local SMEs to find new markets for their technologies, the IRC Bourgogne plays a key part in developing this promising regional capacity.

The need to encourage the take-up of new technologies by SMEs is widely recognised. But the Innovation Relay Centre in Bourgogne also sees SMEs as a key source of technology transfers, and designs its support for the regional automotive industry accordingly.

"Increasingly, large car manufacturers simply assemble and market vehicles, buying in systems and technologies from smaller suppliers," says Ludovic Denoyelle, the IRC's Director. "They are always looking for

technologies which will enable them to improve quality or streamline assembly processes.

"There is tremendous scope for SMEs to supply not just components, but expertise. We try to create opportunities for them to meet larger companies, so that they can offer their know-how as the basis for technological collaboration."

Car of the Future

FIST is an inter-regional subcontractors' fair for the auto-

motive industry, organised annually by the regional Chamber of Commerce whose technology department, ARIST, hosts the IRC. As part of the 1996 FIST, held in Dijon in September, the IRC staged a special one-day technology transfer event under the title 'The Car of the Future'.

Focusing on two specific areas - new materials and on-board electronics - it included presentations of 20 new technologies, many made by small companies. The developers of

two advanced vehicle prototypes displayed during the event, for example, were both SMEs — one Belgian and the other Dutch.

The event was attended by around 100 participants from ten countries. By inviting only carefully selected companies, the IRC was able to arrange over 80 individual meetings between potential collaborators during the day.

"We helped participants to identify opportunities for profitable collaboration, and brought together engineers from different companies to discuss current problems and new technologies," says Mr Denoyelle.

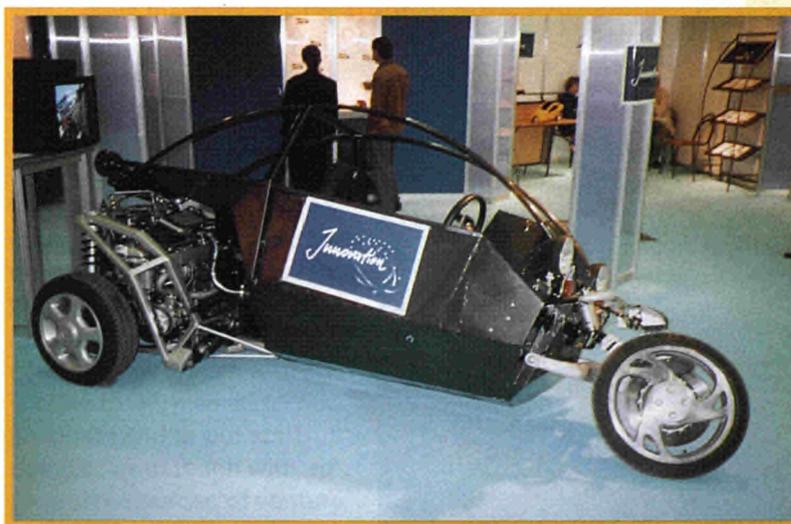
New Partnerships

The brokered meetings, as well as less formal contacts between delegates, produced a number of practical co-operative actions, both to undertake development or pilot projects, and to transfer or exploit research results. Mr Denoyelle gives two examples.

"We invited a small Dutch company, ECO-CAR, to show a prototype of its futuristic light-weight one-person vehicle. This was the first time they had shown their work outside the Netherlands, and it opened their eyes to the potential for transnational partnership. They explored a number of possible collaborations, and are now actively participating in an EC-funded project.

"Although ECO-CAR is not from our region, or even from our country, we are delighted to have helped it to join the European research effort. In fact, since the event ECO-CAR has made contact with its own Dutch IRC — an excellent example of the IRC network effect."

Plastic Omnium, with factories all over France, including one in the Bourgogne region, also benefited from the event. The technology transfer day in-



roduced it for the first time to two possible collaborators, the Belgian company Mitras, and the Swedish Institute for Fibre and Polymer Research, both of whom presented new technologies at the event.

"The company was keen to investigate the opportunities offered by the next generation of cars, which will make extensive use of light-weight composite materials, especially for body panels, bumpers, and vehicle interiors," says Mr Denoyelle.

SME Trade Missions

The IRC's actions in support of the car industry are on-going. With help from the IRC Alps-Torino, in November it took representatives of 10 local companies on a two-day trip to Italy, where they attended an auto-

motive industry trade fair similar to FIST.

In addition to a series of scheduled contacts with potential customers at the fair itself, the French companies travelled to Fiat's Research Centre to discuss its future technology needs.

It is too early to tell whether the visit will lead to contracts for any of the IRC's clients, but Mr Denoyelle has no doubts about its value. "Our aim is to help SMEs to develop and sell their skills and products," he says. "By taking them to Fiat, we gave them a great opportunity to learn about the needs of their market, and to present their own technologies, face to face."

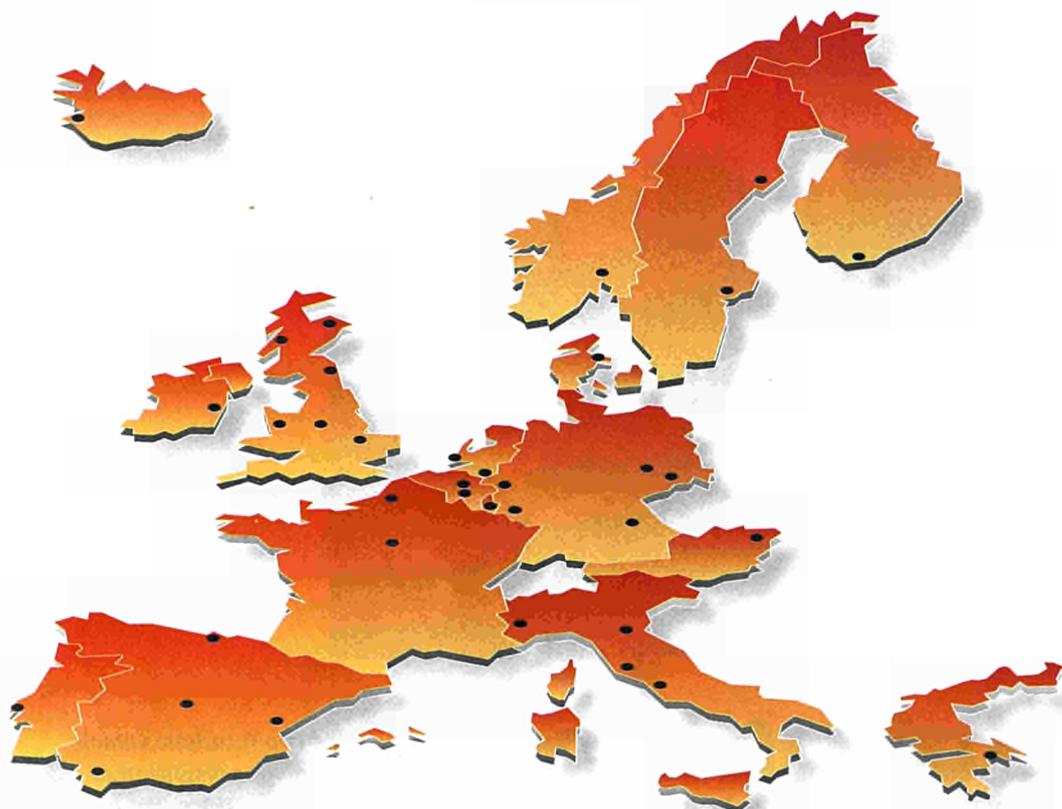
The two futuristic vehicle prototypes displayed at the 1996 FIST event in Dijon were both developed by SMEs. Above: Belgium's 'Gillet' car-maker, finalist in the 1997 European Design Prize (see page 10). Below: The one-person ECO-CAR from the Netherlands.

C o n t a c t
L. Denoyelle,
 Director, IRC Bourgogne/Centre-Val de Loire
 Tl. +33 380 63 52 66
 Fx. +33 380 63 85 58
 E-m. ld-arist-b@axnet.fr

► OPET NETWORK

Promoting New Energy Technologies

The OPET Network, established to diffuse new and efficient energy technologies and facilitate their adoption by the market, has been relaunched by the Innovation Programme.



The OPET network links together 40 centres of expertise in energy technology around Europe.

C o n t a c t
J A Hoyos, DGXIII/D-3
TI. +352 4301 32722
Fx. +352 4301 34009
E-m. Joseantonio.hoyosperez@lux.dg13.cec.be

The first network of OPETs (Organisations for the Promotion of Energy Technologies) operated under the THERMIE Programme from 1991 to 1995. A new network, operational since November 1996, is now managed by the Innovation Programme, in collaboration with the non-nuclear energy programme (Joule-Thermie). It promotes the results of energy-related research projects, particularly those of Joule-Thermie.

Contracts have recently been awarded to a total of 40 OPETs, covering every EU Member State, as well as Iceland, Norway and Liechtenstein. The EC will contribute up

to 75% of each OPET's total costs in the first year and up to 66% in the second, with a budget for the two-year period of approximately 6.7 MECU. Ongoing financial support, at a maximum level of 50% of costs, will depend on satisfactory performance in the first two years.

Access to Energy Expertise

The network is designed to link energy suppliers and energy users regionally, and to provide liaison between them and the Commission. At the European level, it will work with three sectoral groups, cover-

ing rational use of energy, renewable energy sources, and fossil fuel technologies, with the OPETs supported by experts on each of these sectors.

The OPETs will supply information on innovative energy technologies and on EU energy programmes, and will develop regional and sectoral strategies for the introduction of these new technologies. Their role will be to provide end users with easy access to innovative energy technologies.

In renewing the OPET network, the Innovation Programme stressed the importance of active collaboration with market players. It will judge the network's success by the tangible and demonstrable results it achieves in terms of technology take-up, economic savings, and energy consumption reductions.

The network's European dimension will require the OPETs to:

- complement the promotional activities of other European networks, as well as of local organisations;
- facilitate industrial participation in Joule-Thermie research and demonstration projects;
- use and, if necessary, update current databases related to energy technologies, market actors and decision-makers, in order to penetrate the market and match local requirements. □

► CALL RESULTS

Improving Access to New Technologies

What happens to new technologies when those who could profitably exploit them fail to do so? And what happens to industries in which such failures are the norm?

Industries thrive on the percolation of new techniques, processes, materials and equipment. Too often, though, a smaller company which could significantly improve its competitiveness by adopting a particular new technology fails to identify, acquire or finance the exploitation of that technology. Or it may fail to spot a market opportunity for a new technology which it has developed itself.

Supported by the Innovation Programme, new services are becoming available which will help many SMEs to overcome these barriers, facilitating the adoption of cost-saving or value-adding technologies. With the aim of improving the competitiveness of Europe's SMEs, the Commission will support a number of new transnational networks and services between now and the end of the century.

Technology Brokerage Services

One of the seven projects already up and running, BRIGIT, will serve SMEs in the chemicals sector. Its partners - national industry associations in Italy, Finland, the Netherlands and the United Kingdom - had found that poor access to new technologies was the principal barrier to competitiveness among the sector's smaller operators.

"We aim to provide a channel for the flow of new technol-

ogies to SMEs, both from research institutes and universities, and from larger companies," says the project's coordinator, Rein Coster of the Dutch Chemical Industry Association (VNCI). "The technologies concerned range from those involved in the scale-up from batch to continuous processing to those required for compliance with new environmental regulation."

In addition to the brokerage of technology transfers, BRIGIT offers to find markets for new products and to put start-up companies in touch with appropriate sources of venture capital. These services are new at national level, but from the outset they will also have a transnational dimension. "By working with partners in other countries, we can each offer a better service," says Mr Coster. "We will support the formation of consortia of small suppliers, enabling them to bid jointly for contracts to supply large producers, for example in the pharmaceutical industry. This approach would simply not be possible on a purely national basis."

The partners hope that by the year 2000, when the project's 50% EC funding comes to an end, the service will be self-financing. With interest already expressed by national bodies in a number of other countries, they are also confident that they will be able to extend its coverage at that stage. ■



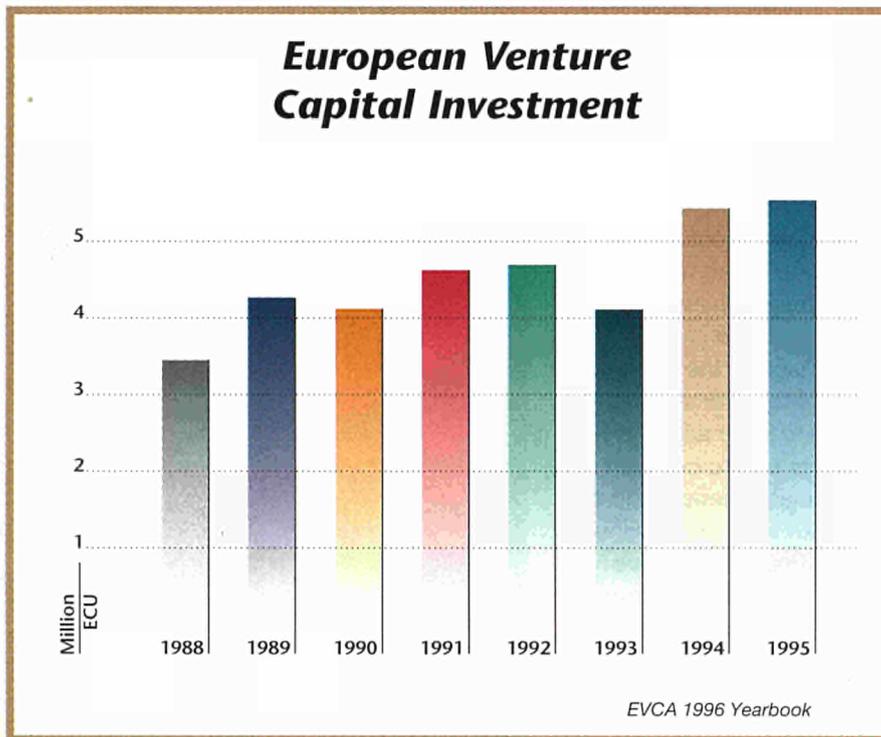
Contact

■ D Moers, DGXIII/D-4
 TI. +352 4301 35093
 Fx. +352 4301 34544
 ■ R Coster, VNCI
 TI. +31 70 337 87 23
 Fx. +31 70 337 87 75

► INNOVATION FINANCING

Venture Capital Pilot Study Breaks New Ground

A survey commissioned by the Innovation Programme and supported by the European Venture Capital Association (EVCA) develops vital performance statistics for European private equity funding



funds established after 1990. Respondents comprise 109 funds from 71 fund managers with a committed capital of 5.6 billion ECU. Response rates were 65% in terms of funds and 78% in terms of value.

Positive Caution

The survey shows that rates of return clearly vary according to the stage of investment. Funds specialising in management buy-outs performed better than other funds generally. Most importantly, the top 25% of performers also did well at the early stage. Generalist funds, investing across all stages, performed significantly better than those specialising in either development or late stage investments.

The main message is one of positive caution. Developing a methodology to provide private equity statistics is a real achievement, but it still needs refining. Early results though have been well received. As Serge Raicher says, "This new survey has shown what private equity funds can really do. The Commission has played a key role here." □

Venture capital in Europe has continued to grow in the 1990s.

The first pan-European survey on venture capital performance has met with widespread interest. "This represents a milestone in the development of the European venture capital industry," says Serge Raicher, Secretary General of EVCA. "For the first time, European performance statistics are available on private equity funding. This is really important and something that the investors have been demanding for a long time."

Lack of effective performance criteria has undoubtedly constrained the development of the European venture capital industry to date. Investors need to be confident about the po-

tential rates of return on venture capital funds. Affected by such factors as market conditions, company age and level of managerial experience, rates of return vary over time and are difficult to determine. With over 30% of new venture capital funding now coming from sources outside the EU and more investors demanding clear performance figures, the development of appropriate methodologies for determining venture capital statistics in Europe has become crucial.

The new pilot survey on venture capital performance promises a way forward. It covers venture capital activities over the period 1980-94, excluding

Contact

■ M. Verlinden,
DG XIII/D-4

Tl. +352 4301 34194

Fx. +352 4301 34544

E-m. marc.verlinden@lux.dg13.cec.be

■ EVCA

Tl. +32 2 715 00 20

Fx. +32 2 725 07 04

Promoting Equity Markets for Innovative SMEs

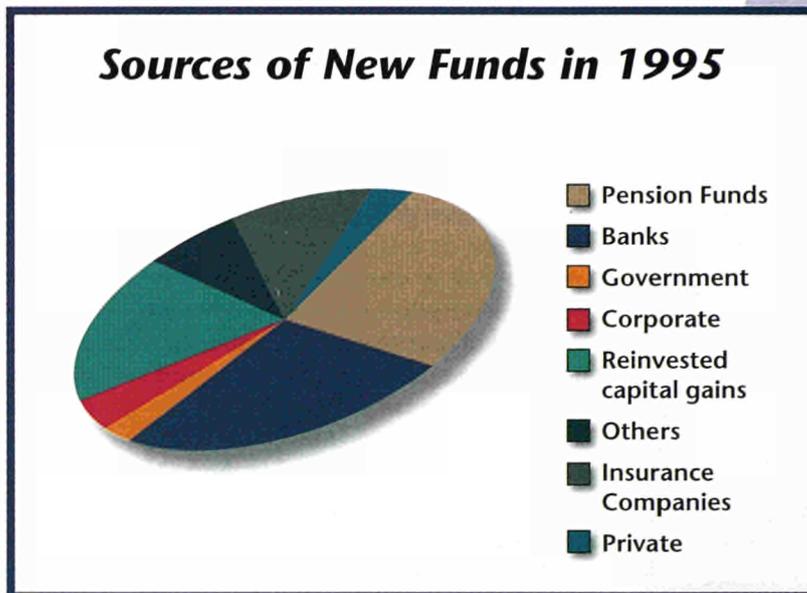
Europe does not lack the skills to support equity markets, but key players must bolster their marketing.

With more effective marketing, European performance in the emerging growth company markets is likely to be strong. This is the key conclusion of the study commissioned under the Innovation Programme on equity market support services for emerging growth companies in Europe, carried out by Graham Bannock and Partners Ltd and ES-SOR Europe.

A number of initiatives to create capital markets for high growth companies have recently seen light in Europe. These include AIM (Alternative Investment Market) in London, the Nouveau Marché in Paris and EASDAQ and others with trans-European aspirations. They are Europe's answer to the US NASDAQ stock market developed in the 1970s to address the needs of growth companies in North America.

For Jos Peeters, past Chairman of EVCA and one of the driving forces behind EASDAQ, the arrival of these initiatives has already significantly changed the prospects of venture capital in Europe. "There has been a dramatic change in attitudes to early stage venture capital. We are seeing a renewal of interest from institutional investors. We need to build on this now."

If these new markets prove successful, a major building block in the innovation financing infrastructure will have been put in place as the markets will attract new investors and enable capital to be recycled into new projects. Long-term success, however, depends on the right framework conditions.



Over half of all new venture capital appearing in 1995 was provided by pension funds and banks.

To work properly, markets need not only investors, but also investment banks, market promoters and professional advisors. These include technical and industry analysts and specialist lawyers who can provide the supporting services, including company research and information, to ensure ongoing investor interest, market transparency and liquidity. Since the European market is fragmented, there is also a need to increase awareness of what is going on elsewhere, especially in relation to the provision of company data.

Promising Prospects

The results of the study look promising. There are at least 120 investment banks in the EU with the experience and capacity to sponsor Initial Public Offerings (IPOs), and the market is highly competitive. Vocational training for financial markets

is increasingly available. Real-time screen-based data for professional market participants is provided by a highly competitive global industry and there are well over 250,000 screens in use in the EU.

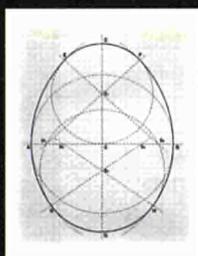
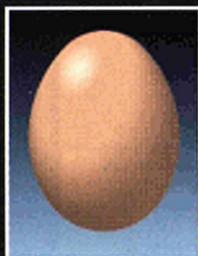
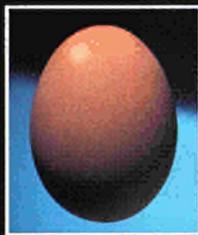
Some constraints do need to be overcome. These include the availability of technology expertise combined with business experience in some of the investment banks and a lack of specialised courses in financial marketing on topics like small capital stocks in market making and specialised financial analysis.

Europe's main deficiencies, however, though lie in the lack of focus and energy with which resources are applied. The study points to some key factors. European players are less committed to industry knowledge and technological expertise than their US counterparts. Public relations, investor relations and marketing are less developed. European players

need to make their services better known. They need to search proactively for companies to bring to the market and become more aware of new market possibilities.

The report concludes on a positive note. Some European firms have taken up the challenge and are now making heavy investments in developing industry knowledge and technological expertise. Very few of the growing number of technology IPOs in Europe have gone to NASDAQ. Local firms have considerable advantages in contacts and local share distribution. And, most importantly, it seems very likely that if European banks and other participants bolster their marketing efforts, they will retain a large share of the emerging growth company market.

BEST PRACTICE



“
... good design
imposes order
and simplicity on
a chaotic world.
It makes it easier
to think.”

Between them, the 64 finalists for the European Design Prize demonstrate how important design can be for innovative companies.

The truism goes that “only one company can be the cheapest in its market - all the rest must use design”. It follows that design is crucial to European industrial competitiveness, as few European companies will be able to compete on price alone in the global economy.

But what *is* design? Like another word - innovation - it means different things to different people. A single, global definition has yet to be found, probably because companies use design in so many different ways. It is fine to say that “a company’s design tells the company’s story”, but what does that mean in practice?

One general definition, however, serves well - design is the process through which raw technology and information is transformed into products that people can actually use. It is therefore a vital instrument of innovation.

No group of companies illustrate this better than the 64 companies short-listed for the 1997 European Design Prize (EDP '97). An Innovation Programme initiative, this European Design Prize, the fifth in a series stretching back to 1988, aims to spread ‘best practice’ in the use of design as a tool for innovation.

The 64 finalists were drawn from a set of around 350 companies considered in national competitions around Europe. They came together to discuss their experiences in Paris last January at the second European Design Industry Summit (EDIS), which was followed by the EDP '97 awards ceremony, during which eleven companies were awarded Design Prizes.

Between them, the finalists illustrate just how important design is to remaining competitive. All companies face the same challenges - society is changing, the global economy is expanding, technological developments are continuously accelerating, and so on. These 64 companies, however, have successfully dealt with these challenges, in part by adopting advanced design.

They have done so in a myriad of ways. All agree, however, that design is no longer ‘what happens after the product is made’, an afterthought to a product’s specifications, market research and the rest. Design has to be integrated into the entire product development process, and this is no

simple task. EDIS was held to help shape their experiences into a set of lessons for European industry. The report from EDIS was being put onto the EDP WWW site as *Innovation & Technology Transfer* was going to press, with a printed version expected soon.



The sophisticated sensors, microprocessors and miniature motors inside each prosthesis from Blatchford make walking more effortless.

ICES IN DESIGN

Product or Service?

While design can be used to tackle a wide range of issues, the finalists were particularly keen to discuss how they could improve their relationship with their customers. 'Customisation' therefore became the main theme for EDIS, where it was discussed in small groups moderated by eight design experts from around Europe.

Customisation is often portrayed as the complete replacement of the mass production paradigm, with each individual product designed for the cus-

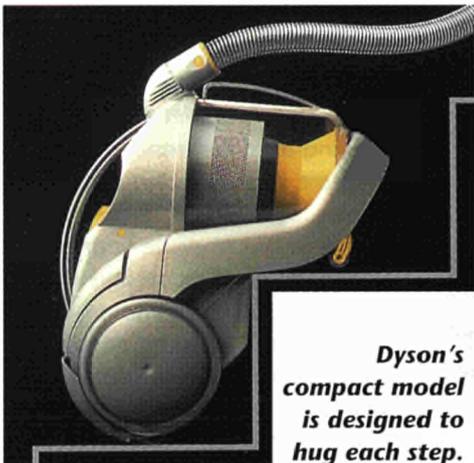
tomers. By operating between the two extremes of pure customisation and pure standardisation, however, many EDP finalists illustrate how simplistic this view is.

One of the most striking findings was that the line between 'product' and 'service' is disappearing as companies search for new ways to customise their goods. This is a result of what a representative of Blatchford & Sons calls "pushing customisation as far towards the factory door as possible".

Blatchford is one of the many EDIS companies to have successfully im-

proved customisation through raising 'product intelligence'. They were the first prosthesis manufacturer to incorporate microchips into their artificial legs - each IP+ (for Intelligent Prostheses Plus) leg can be individually programmed to correspond to each user, and can be reprogrammed by the user using a simple remote control. The result is a more natural and comfortable gait.

Some customisation of the hardware, however, is still necessary, so they have modularised their product to allow customisation at the assembly stage. But the prosthetic experts who ●●●



Dyson's compact model is designed to hug each step.

Driving Design I

Changing Consumer Values

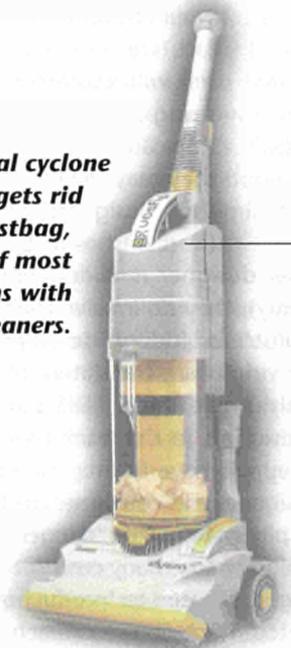
Customisation is just one trend driving innovation. Others, also relevant to design, stem from changes in society itself.

Today's consumers are less tolerant of product failure, more demanding regarding the social and environmental costs of today's products and unimpressed by brand marketing. With quality methods rendering most consumer products similar in terms of performance and price, setting goods apart from the competition becomes more and more difficult. A nice matte black finish is no longer enough.

stop James Dyson from getting rid of it. He replaced it with 'dual cyclone' technology, which uses streams of air moving at almost 1,500 km/h to separate air from dust, pollen and even odorous chemicals. It removes twice as many allergens from the air and never gets blocked. The company's annual turnover increased thirteenfold between 1993-1995.

Similarly, Norwegian furniture company **Stokke** took a second look at sitting and found that normal chairs inhibit the human body's natural movements. They adopted a distinctive design philosophy which reflects the needs of the human body, rather than those of mass assembly systems, and reinvented the chair. Finally, Swedish toolmaker **Hultafors** managed to improve the ergonomics of the hammer, a tool which has been in use for over 50,000 years.

The dual cyclone technology gets rid of the dustbag, source of most problems with vacuum cleaners.



Several EDP finalists used design to meet this challenge. They went back to first principles and 'reinvented the wheel', and made it better. Take **Dyson Appliances**, one of this year's winners. When they looked at the vacuum cleaner they found that the dustbag was the source of most problems. Although it has been part of vacuum cleaner design since its invention over 90 years ago, that didn't



distribute and fit the products perform a great deal of the product customisation, and they are not even employed by the company.

Many other companies at EDIS have gone further and pushed customisation beyond manufacturing altogether. Tor Norbye, managing director of groundbreaking Norwegian furniture maker Stokke, calls this "cultivating the product". "We invented the 'Tripp Trapp' chair in 1972, and there was not much we could do to make it better in itself," he explains. "We were endlessly copied, so we had to add value to our products by adding services at the level of our distributors. Our competition can copy our chairs, but they cannot match the brand loyalty we've developed in our distributors and, through them, our final consumers."

Who is the Customer?

Both Blatchford and Stokke, therefore, put significant resources into working with their dealers: Blatchford trains prostheses experts, while Stokke runs seminars to bring its dealers 'into the Stokke design family', so that they understand exactly how and why their chairs are better for the human body. Most EDIS participants use similar tactics.

In fact, these dealers are the *customers*, and by working together they are brought into the design process, a key issue at EDIS. Identifying which customer to work with is crucial - like Stokke and Blatchford, most EDIS companies identified several customer groups. DMD, a building products firm, listed four for each building project - the architect, the builder, the developer and the people who actually work or live in the building.

Most EDIS participants, like Blatchford and Stokke, focus on the layer of dealers and distributors between them and the actual product consumers, and rely on them for feedback from the end users.

Within the critical customer group, many also pay particular attention to 'activist' consumers. Cultivating these customers can be rewarding - they are more open to new design ideas and can come up with a few of their own. They also often indicate where user trends are headed and, as an added bonus, tend to further promote the product. These activists need, in return, to feel that they know and understand the company's philosophy, that they are part of the company's story, and that their input is making a difference.

A second sort of customer worth particular attention are minority groups, particularly the handicapped. These users tend to impose tougher design constraints which, when successfully addressed, can benefit the product range as a whole. EDP '97 winner Fiskars (Finland), for example, won a design award from the US Arthritis Association for their 'Softouch' scissors, shears and pruners.

And are they Always Right?

Young Irish company Mediacom, creators of an innovative video-conferencing system, tell another story about listening to customers. "We found that most audio-visual distributors, who were our potential dealers, were very keen on touch sensitive screens. It was the trend of the moment, but we felt that this was a case of 'technology push', not 'customer pull'," recalls managing director John Coburn. "So we asked around 20 customers, and we were right - they hated touch sensitive screens! So we used

something else, and the dealers eventually came around."

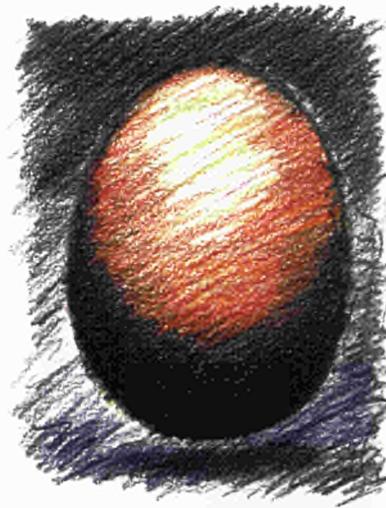
They are not the only finalists who choose not to follow their 'first line' customers slavishly - most believe that a balance has to be found between listening to what customers want and 'leading from the front'.

"Most customers are not designers, so if you listen to them too much you'll dilute your designer's original vision and end up with a 'lowest common denominator'", Mr Norbye of Stokke insists. "Tripp-Trapp answered a need parents didn't know they had - we showed them something that they would never have thought of. In fact, we *never* let our designers mix with customers when developing an original concept."

He adds, however, that while they may maintain the purity of their designers' *original* visions (and it should be noted that

Stokke's chief designer is widely considered the best in Norway), they do involve their dealers during the downstream 'design development' phase, where these visions are translated into final products. Tellingly, while many EDIS participants still 'keep the designers in the back room', most believe that they will have to increase direct contact between designers and consumers in the future.

This is despite many other 'dangers' identified at EDIS in listening to too many customers too closely. For one thing, it can lead to 'product range overkill' - perversely, too much choice can actually turn customers away. Most also felt that going in multiple



"Design is the tribute Art pays to Industry"

Stokke's chairs stimulate, rather than inhibit, the body's natural need for movement and variation.

directions to meet every customer demand can quite easily lead companies well away from their core competences, which can have disastrous effects.

Even if companies guard the purity of their design and stick jealously to their fields of excellence, they may still find that letting customers into the design process can have unintended consequences. Once there, customers can start tackling other issues, putting pressure on the company to change environmental, workplace or trading practices, for example.

The End of the Hierarchy?

All of this may make involving customers in the design process look like negotiating a minefield. Nevertheless, all EDIS participants recognise it as vital, and agreed that design should be a



To add value to their basic product, paper sack maker Bates Disposal (Denmark) developed the 'Combi System' - a flexible, environmentally friendlier and safer household waste system involving specially designed bins, stands, trolleys and trucks.

strategic issue. In most EDIS companies, in fact, the designers had direct access to top management, or they *were* top management.

This is not the only change necessary to many company structures. Letting customers move beyond the sales team

and interact with a company's management, designers, engineers and logistics department represents a revolution. Organisational structures must be flattened and new work practices and information/communication systems introduced. ●●●

Innovation Programme Networks

Promoting Design to SMEs

The Innovation Programme is supporting three European networks dedicated to promoting design techniques to SMEs.

The Innovation Programme is promoting over 30 projects designed to improve the know-how of national and regional organisations under its 'promoting innovation management techniques to SMEs' action line (see edition 6/96). Three of these projects focus specifically on design.

All pool the experiences of their members to help identify the best methods for promoting design to SMEs and could involve some innovation consultancy assignments to SMEs. Each network, however, addresses different aspects of design and will disseminate their findings in different ways.

The three networks are:

■ **Dissemination and Promotion of Design Engineering Tools and Techniques (DENTOT):** This consortium involves five members from Denmark, Germany, Spain and the UK, and will focus on design engineering techniques for product development. These will be summarised in the 'DENTOT handbook', which will also include information on best practices, case studies and available tools. Each partner will host a

workshop to raise awareness of the costs and benefits of these techniques in improving productivity, quality and time-to-market.

■ **European Design Innovation Tool (EDIT):** The eight organisations in this network are from France, Germany, the Netherlands, Norway, Portugal, Spain and Sweden. They will refine a 'common methodology' for improving SME knowledge of design management, assess companies and disseminate the results. This method will be backed up with best practices and disseminated throughout Europe at conferences (in Eindhoven and Stockholm) and a range of media.

■ **Measures for promoting innovation management techniques (MAP-TGI):** The five members of this network (in Belgium, France, Germany and Luxembourg) are examining four issues: global design, strategic design, rapid prototyping and technology transfer. They will hold transnational workshops to examine various design promotion methods, create a CD-ROM to help promote these methods and investigate

'case studies' which could be used in training seminars and other future activities.

(O N T A C T

■ DENTOT

M. Zaldumbide, SOCINTEC (Spain)

Tl. +34 4 480 02 11

Fx. +34 4 480 03 91

E-m. mzaldumb@socintec.com

■ EDIT

I. Gil, DDI (Spain)

Tl. +34 1 572 10 83

Fx. +34 1 571 15 64

■ MAP-TGI

J-P. Grojean, Pôle Universitaire Européen Nancy-Metz (France)

Tl. +33 3 83 17 67 40

Fx. +33 3 83 17 67 65

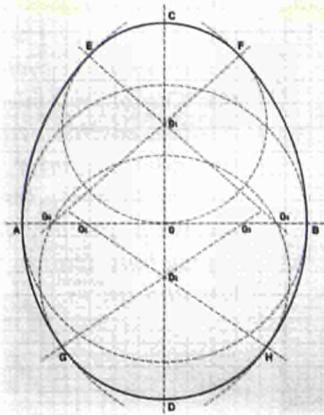
E-m. conard@europole.u-nancy.fr

Http://www.europole.u-nancy.fr

■ Innovation Management Technique Projects

D. Amil, DG XIII/D-4

Fx. +352 4301 34544



"Design is the difference between doing it, and doing it right."

●●● Many at EDIS found an interesting model in another EDP '97 winner, the Danish digital hearing aid manufacturer Oticon. "Traditional hierarchies - bosses, offices, departments, etc. - were designed to make companies act like machines," Lars Kolind of Oticon points out. "That's fine if the company produces machines and the workers have to act like robots. But, more and more, companies are in the business of producing knowledge, so they have to be structured to work like a brain. The hierarchical structures have to go."

Oticon's 'spaghetti organisation' - a tangle of relationships, interactions and constantly changing project clusters - means short communication lines and decision chains. The framework liberates the workforce's creative resources and has propelled the company to industry leader. And it works - apart from winning a European Design Prize, they also picked up a European IT Prize last November (see last issue). □

Definitions of design courtesy of the UK Design Council.



"Winners! How Today's Successful Companies Innovate by Design" analyses eight 'Drivers of Innovation' and backs up the theory with dozens of examples from the Design Prize shortlist. English only, 476-pages, around 400 illustrations.

(O N T A C T
A. Bradley, European Design Partnership

TL. +353 1 660 17 22

Fx. +353 1 660 16 35

E-m. bradley@iol.ie

[Http://www.design-inst.nl/edp/edprize.html](http://www.design-inst.nl/edp/edprize.html)

Driving Design II

Designing in Intelligence

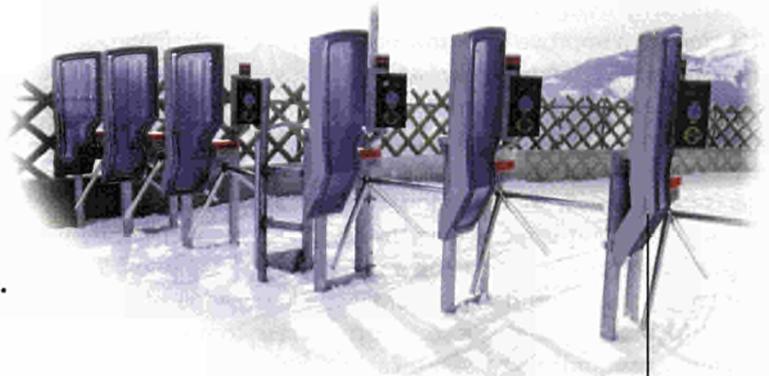
It now takes more computing power to run a luxury car than it did to send astronauts around the Moon.

If consumer values are changing, technology is changing even faster. This offers fertile ground for designers, who can make their product lighter, simpler, more robust, 'greener', uniquely beautiful and more flexible.

One of the most exciting materials, however, is silicon. Many EDIS finalists such as Blatchford (see page 11) have started integrating intelligence into their products. This will become a revolution when these products start talking amongst themselves in order to serve their users better. At that point they cease to be inert, discrete objects - they become part of a network, and their

manufacturers are transformed from hardware suppliers into information professionals.

EDP '97 finalist **SkiData** illustrates this perfectly. This Austrian company develops and implements electronic ticketing and entry systems for environments ranging from ski-lift units to trade fairs. They did something unusual for a ticketing system vendor, however - they dispensed with the tickets. Instead, users load access credit into their watch, developed in partnership with the Swatch company. Skiwatch scanners read the watch as users head for the slopes or the exhibition hall, debit



Skidata's access terminal system - bringing intelligence to your watchstrap.

their account and allow them through.

The key here is that Skidata no longer supplies hardware as simple as a ticket vending machine - it supplies an embedded computer network which makes life easier for the people within it.

► BENCHMARKING INDUSTRY

Improving Supplier- Manufacturer Cooperation

The 'EU-Japan Consumer Electronics Parts and Components Programme' has led to significant improvements in the productivity of European electronics suppliers, and reinforces the EC's view that 'benchmarking' is a powerful tool for improving industrial competitiveness.

More than 170 companies have already taken part in the programme, which has been funded by the EC, the Japanese government and the companies concerned since 1993. The programme introduces European suppliers, mostly SMEs, to the methods practised by Japanese manufacturers of consumer electronics.

To date, suppliers of printed circuit boards, plastic components, connectors and stamped metal parts have participated and benefited from customer audits, workshops and seminars funded by the programme. Industry experts also helped the suppliers benchmark their companies against the 'best in class', and implement the necessary improvement programmes.

According to the programme's co-ordinators, International Co-operation Europe (ICEL) in Brussels, both European and Japanese manufacturers have a common interest in enhancing quality because both source components widely in Europe.

The activities are defined by the companies involved, with participating SMEs receiving up to 50% of their total project-related costs. According to ICEL, the results are clear. The **plastics moulding project**, for example, resulted in a 15% gain in productivity, significant

reductions in part rejection rates - in one case by 50% - better quality and delivery performances and improved sales and profitability. In another project, on **mechanical connecting parts**, all of the suppliers have since upgraded their production lines, cut inventories and introduced computer control systems in manufacturing.

Industrial Follow-Up

Probably the greatest proof of success, however, is the fact that many programme participants are now continuing their activities without public funding. "Participation has created opportunities and opened the mindset for re-orientation of operational structures," confirms a spokesperson for Philips Electronics, while Nokia says that their project has "given us ideas of how to improve quality together with suppliers". German manufacturer Ninkoplast adds that it identified ways of improving its overall performance and hoped the mission "would not be a single event, but the start of an accelerated process" towards greater co-operation between Europe and Japan.

The last activity funded by the programme's 1996 budget - a workshop between Toshiba, NEC and over 40 of their European suppliers - was held last January in the UK. Funding to

continue the programme in 1997 was being sought as *Innovation & Technology Transfer* went to press. If approved, the programme plans to launch more continuous improvement and benchmarking activities, as well as new projects into the benefits of electronic networking between suppliers and manufacturers. □

The various projects are presented in a series of reports from ICEL.



C o n t a c t
C. Dillon, ICEL
Tl. +32 2 503 04 19
Fx. +32 2 514 13 42
E-mail. icel@pophost.
eunet.be

► SURVEY

Restructuring Europe's Aerospace Industry

Europe's aerospace industry is world-class. It will need further innovation and restructuring, however, to face its competitors - both old and new.



Airbus Industrie's A340 has the longest range of any airliner in the world.

The global aerospace industry is in flux. The past few months, for example, have seen Boeing take over McDonnell Douglas, the Airbus consortium announce far-reaching restructuring plans, a revitalised EC commitment to space policy and the confirmation of German commitment to *Eurofighter*.

The stakes are high. It is a growth industry - the civil aircraft market is expected to reach US\$1 trillion over the next twenty years, which translates into orders for at least 12,000 passenger jets. Europe's aerospace industry alone has an annual turnover of close to 35 billion ECU and is responsible for exports of 20 billion ECU. It employs some 300,000 people directly and also supports 80,000 suppliers, including many SMEs, which in turn employ over half a million more. Finally, it is a source of a wide range of advanced tech-

nologies which spin-off to the benefit of other industries.

The Boeing take-over of McDonnell Douglas underlines a trend in the US towards economies of scale which is not being matched in Europe. According to the European Association of Aerospace Industries (AECMA), the European industry must be restructured on a transnational basis. Too many European companies are competing with major US conglomerates, leading to fragmentation of strategy and duplication of research efforts. In their submission to "The Future of the European Aerospace Industry", a symposium held in Brussels last November, they called on European-level initiatives to reform the regulatory, legal and financial environment and renew efforts to ensure fair international competition.

AECMA also called for increased funding for aerospace

R&D in current and future Framework Programmes and a reinforcement of the Aeronautics Task Force, with a focus on industrial requirements and demonstration projects. The Task Force (see the Transport R&D Dossier, edition 4/96) is focusing European research into distributed concurrent engineering networks and more efficient and environmentally friendly aircraft.

Coordinating Space Policy

In the space sector, Europe's Arianespace dominates the satellite launch market (see 'Airbus and Arianespace'). Benefiting from the growing space industry, however, requires more than launch capacity - a level playing field in the commercial launch sector is as vital. Similarly, it is not enough to be able ●●●

Contact

■ H. Allgeier, Space Coordination Group and Aeronautics Task Force
Fx. +32 2 296 29 80
■ P. Signargout, AECMA
Fx. +32 2 775 8111

Airbus and Arianespace

Airbus Industrie and Arianespace are both early examples of successful trans-European integration in the aerospace industry - or any industry.

Formed in December 1970, the Airbus consortium (actually a European Economic Interest Group) is led by Aerospatiale and Daimler-Benz Aerospace Airbus, who each hold 37.9% of the shares. British Aerospace (20%) and Spain's CASA (4.2%) complete the partnership. The consortium has been operating in the black since 1990 and currently claims 42% of the world market for large jets. The order book is growing - 126 aircraft were delivered in 1996, growing to 183 this year and around 220 in 1998.

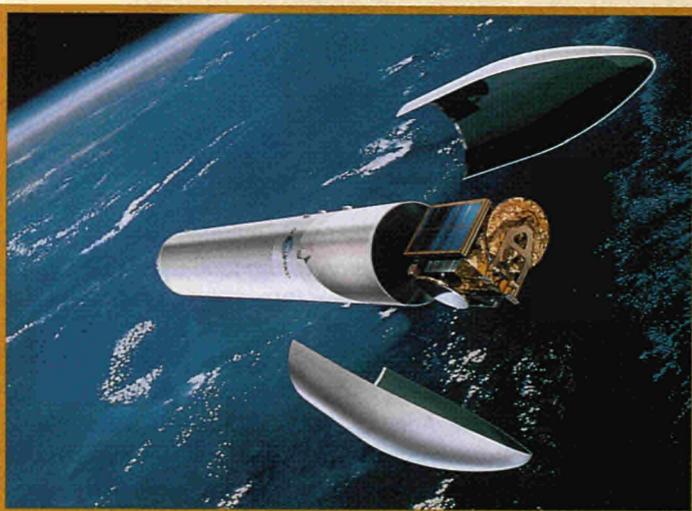
From the outset, the partners understood that in order to break US market domination they would need to offer both lower costs and superior technologies. The history of Airbus is therefore one of technological firsts, starting in 1974 with the first Airbus (the A-300), which was also the world's first twin engine widebody aircraft.

Subsequent innovations have included automatic landing systems, 'fly-by-wire' control systems, electronic centralised aircraft monitors and digital auto flight systems. Airbus has also pioneered the extensive use of composite materials, which offer significant savings in weight, and hence fuel. There is also a unique level of component and operating communality between models, reducing operator costs in many ways.

The recent announcement that Airbus is to develop the 550-seater A3XX aircraft at a cost of around 6 billion ECU has been warmly welcomed throughout the in-



Airbus Industrie pioneered 'fly by wire' control.



Will Ariane 5 maintain Europe's dominance of the global commercial satellite launch market into the next century?

dustry. Recent international agreements restrict government aid, however, so Airbus is currently embarking on the most radical restructuring it has ever seen - replacing the consortium with a single corporate entity, able to raise private capital more easily, by 1999.

Leading to Orbit

While Airbus aims to reach 50% market share against the new Boeing-McDonnell

Douglas company, Arianespace dominates its market. It launched a record-breaking 15 satellites last year (60% of the market for commercial launches), signed 19 more launch contracts and has 42 satellites on its order book. It aims to launch 70 satellites from 1996-1999 - nearly 50% more than in the seven previous years.

Competition, however, is becoming fiercer. US giant Lockheed Martin, for exam-

ple, has formed an alliance with Khronichev Enterprise and RSC Energia, both of Russia. Boeing, RSC Energia, Kvaerner (Norway) and NPO-Yuzhnoye (Ukraine) are developing the revolutionary "Sea Launch" project, which aims to take the short route to orbit by launching from a converted oil rig moored in equatorial waters. And other countries, such as Japan and China, are also entering the market.

One of Arianespace's responses to these challenges is Ariane 5. Unfortunately, the first test flight of this new workhorse last year ended in failure when the rocket had to be destroyed when a software fault caused a malfunction in its inertial guidance systems. The hopes of the European space community ride with the next flight, scheduled for July. If Ariane 5 is successful, it will combine the reliability of Ariane 4 with the ability to launch two communications satellites, each weighing around 3 tonnes, into geostationary orbit with every rocket, guaranteeing Arianespace's position as premier launch service into the next century.

C o n t a c t
 ■ Airbus Industrie
 TL. +33 561 93 3220
 Fx. +33 561 93 4955
 Http://www.airbus.com
 ■ Arianespace, Communications and International Affairs
 TL. +33 1 60 87 60 07
 Fx. +33 1 60 87 63 04
 Http://www.arianespace.com

to build satellites and transponders - fair access to orbits and frequencies is critical, as is the ability to develop ground stations, standards and, most importantly, added-value services.

The EC's recently relaunched policy on space applications was summarised at the sym-

posium by Jean-Pierre Contzen, Director General of the Commission's Joint Research Centre (JRC), and further developed in an EC communication published last December. The communication⁽¹⁾ covers three important areas of civil space applications:

■ **Satellite communications.**

This market, estimated at 220-300 billion ECU over the next decade, will be dominated by personal communications and broadband, 'Internet-type' communication systems. The EC is developing an action plan for both based on partnership between the public and private sectors.

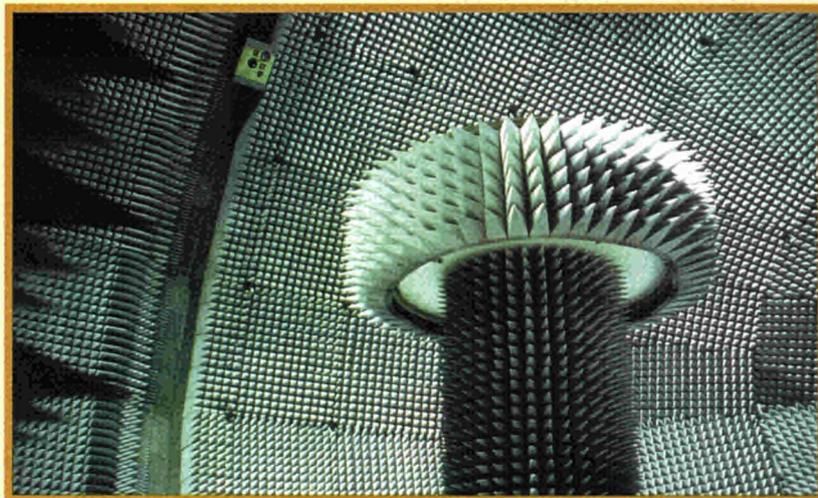
■ **Satellite navigation and positioning.** Today's American and Russian systems, originally developed for military purposes, should be replaced by a Global Navigation Satellite System (GNSS). The equipment market alone will rise to 4 billion ECU by 2000 and 25 billion ECU in 2005. The EC is developing an action plan aimed at establishing a European contribution to a future GNSS.

■ **Earth observation.** Current customers for remote civil sensing are predominantly public entities, but applications could expand to include telecommunications, construction and agriculture. As a large purchaser of data services, the EC intends to play the role of 'pioneer user', while the JRC's Space Applications Institute (see box) will play a significant role in research and development.

Securing Europe's presence in these fields goes beyond the remit of the space agencies or the capacity of individual Member State policies, so all European-level policies and activities touching on space must be coordinated. For this reason the EC recently established the Space Coordination Group, chaired by Herbert Allgeier, who also chairs the Aeronautics Task Force.

The Group will assure the coherence of various European policies, establish a framework for monitoring space activities, develop regular consultation between industry, national and international organisations, and coordinate 'technology watch' and socio-economic analyses of the space sector. ■

Joint Research Centre Space Applications Institute



The EMSL provides researchers with a unique facility for developing remote sensing techniques. Applications range from monitoring land use from space to car-based systems for analysing road conditions.

Known until recently as the Institute for Remote Sensing, the JRC's Space Applications Institute (SAI) is organised into six units: Agricultural Information Systems, Earth Observation, Environmental Mapping and Modelling, Marine Environment, Monitoring of Tropical Vegetation and Advanced Techniques.

The Institute runs a number of large-scale facilities, such as the European Microwave Signature Laboratory (EMSL, pictured), and is a recognised centre of excellence in remote sensing. A major part of its research is carried out under the Environment and Climate research programme, in which the Institute is responsible for the exploitation of satellite data for monitoring land cover, degradation and use on European and global scales. Other R&D topics range from monitoring oil slicks to locating land mines (see edition 3/96).

Many of its projects involve working with many of the world's leading space and en-

vironmental bodies, including the European Space Agency, EUMETSAT, the European Environment Agency, the US National Oceanographic and Atmospheric Administration, NASA and Japan's National Space Development Agency.

The SAI intends to promote access to Earth observation data and services and increase awareness of its potential, bringing together potential suppliers and users of data. A testbed, Internet-resident electronic information exchange system is currently in development.

C o n t a c t

JRC Public Relations Office
Tel. +39 332 78 91 80

Fx. +39 332 78 58 18

E-m. prp@jrc.it

Http://www.jrc.org

(1) "The European Union and Space: fostering applications, markets and industrial competitiveness". Reference: COM (96) 617 final

► FUSION PROGRAMME

Opportunities for Industry

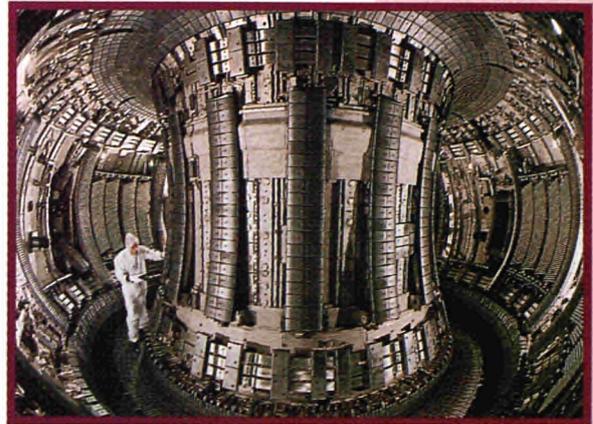
The Commission's Fusion Evaluation Board emphasises the vital contribution to fusion research made by European industry, and recommends its close involvement in the coming demonstration phase.

Fusion power may provide a safe and environmentally-friendly answer to the problem of diminishing fossil fuel reserves. The process uses deuterium and lithium, which are both available in quantities which will last for many thousands of years.

Power generation in the megawatt range was first demonstrated in the European Union's Joint European Torus (JET) in November 1991. But the cost of developing the technology into an exploitable energy source requires an international effort. Europe has joined forces with Russia, the US and Japan to plan the next step, the International Thermonuclear

Experimental Reactor (ITER).

The Fusion Evaluation Board's recently published report urges that building ITER should be made the top priority of the Fusion Programme under the EU's Fifth Research Framework Programme. It notes that industry has made a large contribution to establishing Europe's leading position in the field, providing research hardware and developing components. It recommends further strengthening of European capacity and competitiveness in preparation for the subsequent demonstration phase (DEMO), and that ITER should, if possible, be built in Europe. ■



Interior of the JET vacuum vessel at Culham, near Oxford (UK).

C o n t a c t
 R. Saison, DGXII
 Tl. +32 2 295 40 62
 Fx. +32 2 296 42 52
 E-m. Regis.Saison@
 dg12.cec.be

► INFORMATION SOCIETY

Copyright Enters the Digital Age

Two new Treaties updating international copyright protection, agreed last December under the auspices of the World Intellectual Property Organisation (WIPO), promise to bring copyright and related rights into the digital age.

They bolster protection against software piracy worldwide and provide an exclusive right for authors and performers to authorise the digital availability of their work. This opens the way for many industries to develop Internet-based 'pay as you go' services, which is expected to give Europe's 'con-

tent industries' a boost. They also ensure that the temporary copies of digital material that users create as they browse the World Wide Web are not treated as copyright violations.

The Treaties must now be ratified by national governments. Some areas of disagreement remain, while agreement was not reached on a third Treaty covering databases, under which information like stock prices and football league statistics could have been copyrighted. Work on these issues will continue in the coming months.

Meanwhile, a new Commis-

sion Communication on Copyright and Related Rights has been published by DG XV as part of the Commission's ongoing development of a strategy on electronic copyright (see edition 6/96). Complementing the WIPO negotiations, it sets out four key priorities for legislation: reproduction rights, rights of communication to the public, legal protection of anti-copying systems and distribution rights. ■

C o n t a c t
 ■ DG XV/D
 Tl. +32 2 295 53 23

Fx. +32 2 295 09 92
 E-m. jrg.reinbothe@
 dg15.cec.be

■ WIPO
 Tl. +41 22 730 91 11
 Fx. +41 22 733 54 28
 Http://www.wipo.org

► ESPRIT

Power Discs on the Market

A three-year Esprit project led by French data storage specialist Nomai has resulted in a highly successful removable hard disc drive. The new standard is being supported around the world.

Nomai's Power Disc
- 540MB in a removable cartridge
the same size as a floppy disc.



In recent years the need for a better data storage standard has become urgent due to the burgeoning data storage requirements of the computer industry worldwide, driven largely by multimedia products.

Nomai's new Power Disc Cartridge, first released last March, has become instantly popular among industry users. As *Innovation & Technology Transfer* went to press Nomai was expecting to announce sales of around 30,000 units by the end of 1996. According to Nomai marketing manager Charles Humann, "while accurate predictions are difficult, this enormous success should boost our total sales revenue figure for 1996 to more than double that for 1995."

The benefits of the new technology are many. First, end-users get 540MB - the capacity of a hard disc - in a cartridge the same size as a 3.5-inch floppy. This means that computer users can easily transport

in one handy, pocket-sized cartridge the equivalent of 400 floppy discs - or some 60 minutes of MPEG film or 800 CD colour pictures.

Secondly, the new drive is fully compatible with other manufacturers' cartridges, particularly with the SyQuest 270MB cartridge. In addition, the disc is compatible 'forward and backward', which allows users to put new data on to the disc in the order or sequence required. Lastly, Nomai has created a long-life product - of some 250,000 hours MBTF (mean time before technical failure).

Worldwide Standards

Nomai, based in Avranches near Mont-St-Michel in western France, invested more than Ffr30m over three years in the power disc project. The company has also created a new world standard in removable

hard disc technology, named PDC (Power Disc Cartridge), an achievement which involved active co-operation with the world's leading disc maker, the US company SyQuest. Crucially, the new standard is being supported by other leading makers such as Maxell, Memorex and Rhône-Poulenc, and by the electronics division of Philips.

To protect its technology Nomai has successfully patented the Power Disc Cartridge throughout Europe and the US. "It costs a great deal of money," commented Nomai spokesperson Aude Lemeilleur, "but in the end patents are vital in helping to guard your inventions."

"None of this would have been possible without the close collaboration of our partners in the Esprit project," she adds. These included the research laboratories of UK firm Myrica, teams of academics from the universities of Manchester and Plymouth, the expertise of hard disc manufacturer IBM-Xyratex, and Acorn Computers, part of Italy's Olivetti group.

Nomai is now involved in three other Esprit projects, and its researchers are currently working to develop innovative, "and currently very secret", solutions to further problems of removable storage discs. ■

C o n t a c t
Nomai
Tel. +33 1 39 46 25 59
Fax. +33 1 34 65 31 07

Towards a Multilingual Global Village

The new Multilingual Information Society Programme (MLIS) will help European companies overcome existing language barriers in the Single European Market.

The MLIS programme promises to help businesses overcome one of the fundamental barriers to the emerging Single European Market: language. Over 40 languages and major language variants are spoken in Europe today - a factor which will become increasingly important in the context of the Information Society. As technology makes access to information and knowledge easier, people are demanding the right to access material - electronic and printed - in their own language.

Such demands provide real opportunities for those in the information sector. The cultural and linguistic diversity of Europe is driving many new market opportunities. The Commission wants to encourage European companies to prepare for the future and provide information for their European markets in all of the relevant languages. But this is not just an issue for the business information sector. All industry sectors - including the more traditional ones like textiles and chemicals - will need to adapt their marketing and technical information to the demands of the Information Society.

Access for All

The basic premise of the 15 MECU, three year preparatory programme is that every citizen should have full and equal access to information services using their own language, and that language barriers do not inhibit use of Information Soci-

ety applications and services.

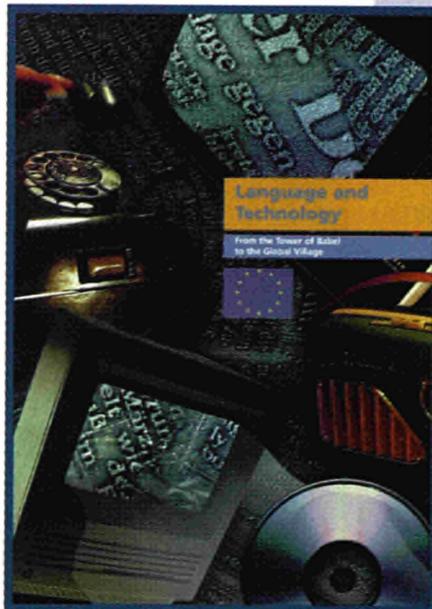
MLIS aims to promote linguistic diversity within the Community, facilitate the development of multilingual services, provide support for European language and translation industries, promote business awareness of the value of multilingualism and reduce the cost of information transfer among languages, especially for SMEs.



It is closely related to the INFO 2000 programme and will make use of facilities like the Multimedia Information Demonstration and Support Network (MIDAS-NET). Established in January, the role of this network of advisory centres is to help information users to exploit the potential of multimedia. Target groups include trade and industry associations, SMEs and libraries.

Business Support

The MLIS action line 2 - encouraging the use of language technologies, resources and standards - will be of particular interest to European businesses. Tasks envisaged include the integration of linguistic and cultural issues into marketing strategies and stimulating the development of business-oriented multilingual



Published with the launch of the MLIS Programme, 'Language and Technology' provides an introduction to language technology research, applications and markets. Printed in all EU languages during 1997, and available on the MLIS WWW page in English (Adobe Acrobat format only).

information and documentation services.

Other actions include the creation of a framework of services (including electronic marketplaces) for European language resources and the use of advanced language tools in the public sector.

A successful Information Day was held in Paris at the end of January. As *Innovation & Technology Transfer* went to press, the first Call for Proposals for developing services in the translation sector and language use in the business sector was planned for the second half of February.

Contact

■ MLIS: J. Roukens,
DG XIII/E
 Tl. +352 4301 34117
 Fx. +352 4301 34655
 E-m. MLIS@lux.dg13.cec.be
 Http://www.echo.lu/mlis/mlishome.html
 ■ MIDAS-NET Central
 Support Team
 Tl. +352 40 11 62 232
 Fx. +352 40 11 62 234
 E-m. cst@echo.lu
 Http://www.echo.lu/info2000/midas/home.html

► JOULE II

Energy and Environment: A 'Win Win' Game

Can Europe introduce the new technologies needed to conserve energy and protect the environment without harmful effects on competitiveness and employment? A JOULE II project has found that it can.

“Technological progress for competitiveness and employment: the case energy-environment”⁽¹⁾ contains the results of a series of linked studies conducted as part of the non-nuclear energy research programme (JOULE II).

The studies, originally presented at a conference organised by the Paris Chamber of Commerce and Industry (ERASME), assessed consumer demand for environmental responsibility and eco-products, forecast the energy savings which would result from diffusion of the best available technologies and their effects on industry's operating and labour costs, evaluated the environmental and macro-economic impacts of these technologies, and considered public policy options for promoting their adoption.



Squaring the Environmental Circle

It is widely believed that policies designed to protect the environment will constrain economic growth and competitiveness. But, the report says, this argument is based on an assumption that a tax on polluting emissions, or 'carbon tax', is the only available policy mechanism.

One of the study's most interesting conclusions is that "policies that stimulate environmental R&D, technological innovation and diffusion can provide firms with the right incentives not to damage the environment, whilst preserving

their competitiveness in the market. Moreover, such policies, based both on R&D subsidies and on voluntary agreement, are unlikely to worsen the public sector budget balance due to the positive effects on economic growth."

The report also found that the new technologies with the greatest potential for energy savings are technical improvements to cars, better building insulation, improved industrial process controls, and improved industrial combined heat and power (CHP). The last two appear to be the most efficient in terms of energy savings per ECU of investment.

These and other technologies can play a key role in solving environmental problems. How-

ever, public policy is needed to promote technological innovation and encourage its widespread diffusion. These new technologies are inherently more efficient, and their adoption may lead to reductions in employment. On the other hand, expansion in the use of renewable energy resources, while reducing environmental impacts, will also have positive employment and commercial consequences. ■

The report shows that improving vehicle efficiency is one of the most efficient ways to save energy per ECU of investment.

(1) EUR 16712, English and French, 149 pages.

C o n t a c t
P. Valette, DGXII/F-1
 Tl. +32 2 295 63 56
 Fx. +32 2 299 49 91
 E-m. Pierre.Valette@
 dg12.cec.be

Investment Forum 10-11 April, Berlin (Germany)

Supported by the Innovation Programme, Transnational Investment Fora bring together interested financiers and innovative SMEs in a one or two day event. To date, some 15 investment fora have been organised across the EU. Some have been of a general nature whilst others have had a specific industry focus such as biotechnology. The next one will be held in Berlin.

These fora offer opportunities to meet other SMEs active in similar industry sectors and to meet with financiers. On average some 15 to 20 financiers can meet 20 to 30 innovative SMEs. These SMEs are pre-selected and have received a thorough preparation before the event. At the event itself, they introduce themselves in a 10 to 15 minute presentation, after which they can have more discreet, one-to-one discussions with interested financiers.

The investment fora have had notable success. A first evaluation found that two thirds of participants found a financier and/or business partner within six months of the event.

The Berlin meeting is organised by VDI/VDE (Germany) in collaboration with ANVAR (France), CDTI (Spain), ENEA (Italy), FFF (Austria), NUTEK (Sweden), SENTER and the Norwegian Research Council. A further meeting is scheduled for November to coincide with the ESPRIT week in Brussels.

Contact: VDI/VDE-IT

Tl. +49 33 28 435 162

Fx. +49 33 28 435 208

E-m. schrader@vdivde.it.de

OBEC'97 - Overcoming Barriers to Electronic Commerce 21-25 April, Malaga (Spain)

A conference on "Overcoming Barriers to Electronic Commerce", OBEC'97, is being organised by EUMEDNET, a group of industry and academic teams promoting the commercial use of the Internet in Europe and the Mediterranean countries through

research, training and awareness campaigns.

OBEC'97 will bring together experts, researchers, entrepreneurs and policy makers with the aim of examining the various barriers to the use of information highways in Europe and the Mediterranean countries (linguistic, legal, cultural, technical, etc.) and how best to surmount them. The objectives of the conference are to increase confidence in Internet security and payment methods; make electronic commerce software more user-friendly; increase the understanding of electronic commerce tools among SMEs and new entrepreneurs; increase awareness among regional and local authorities of the effects of electronic commerce on economic and social development and of the need to support it.

EBETEMA, an academic Euro-conference on "Barriers to electronic trade in Europe and the Mediterranean Area", supported by DG XII of the European Commission, will take place in parallel to OBEC'97. Other parallel events include an art exhibition entitled "The Information Society is made for human beings", and a public showroom, "Tools for electronic commerce". The event will take place in English and Spanish.

Contact: Juan Carlos M. Coll

Tl. +34 5 22 29160

Fx. +34 5 21 32338

E-m. coll@vnet.es

Http://www.vnet.es/obec

GEN'97 International Symposium on Global Engineering Networking 22-24 April, Antwerp (Belgium)

The 1997 International Symposium on Global Engineering Networking, GEN'97, is being organised by the GENIAL project, funded by the Information Technologies research programme (ESPRIT).

Global Engineering Network (GEN) is an initiative supported by the European Commission to foster the use of networks to open up world-wide markets for users and suppliers of engineering products and services. These networks

Patinnova '97 - Unlocking Innovation

5-7 May, Vienna (Austria)

Too many marketable innovations remain hidden away in Patent Offices. Patinnova '97 will encourage patent professionals and the R&D community to exchange ideas with a view to stimulating commercial exploitation of patented technologies.

Patinnova '97, the first with an East European perspective, focuses on the economic value of patents. It is organised by the European Commission, the Austrian Federal Ministry for Economic Affairs, the European Patent Office and the Austrian Patent Office. The aim is to improve delegates' knowledge and understanding of the role of patents in the innovation process and to stimulate commercial exploitation of patented technologies.

The conference addresses three key themes - the value and use of patents as a source of information, the use of patents and patents as a means of protection. An accompanying exhibition provides an opportunity for patent offices, innovation centres and others to present their activities and provide advice.

Contact: Teamwork Patinnova '97

Tl. +33 1 43 67 79 79

Fx. +33 1 43 67 79 00



aim to make engineering knowledge, solutions, methods and services available via data networks in order to improve world-wide cooperation between engineers and providers of engineering products and services and facilitate more efficient product innovation and development.

GEN'97 includes an Industry Day (22 April) and two days of workshops. The Industry Day is expected to attract senior managers and IT decision makers, as well as IT technologists involved in development. The workshops will provide a forum for more in-depth technical presentations and discussions. In addition, the GEN'97 exhibition will enable delegates to see real case studies and demonstrations of EU technology development projects, industrially implemented solutions and IT vendor frameworks.

Contact: GEN'97 Symposium Secretariat

Fx. +32 16 32 29 84

e-m. gen97@c-lab.de

Http://urobe.uni-paderborn.de/gen97

1997 Industry Week 13-16 May, Lyon (France)

Organised by the Chamber of Commerce and Industry in Lyon, the 1997 Industry Week trade fair brings together companies looking to form partnerships in a wide range of sectors. The programme includes a number of European technological meetings organised by the Chamber of Commerce and the Rhône-Alpes Auvergne Innovation Relay Centre. Pre-arranged via a catalogue distributed throughout the EU, these allow companies to meet on a one-to-one basis with a view to facilitating technology transfer, licensing agreements and joint ventures.

Contact: Chambre de Commerce et d'Industrie de Lyon

Tl. +33 4 72 40 57 94

Fx. +33 4 72 40 59 65

■ DOING BUSINESS IN EUROPE

DG XXIII's new series entitled 'Doing Business in Europe' is designed to highlight the various EU-funded initiatives and programmes providing support to businesses and SMEs in particular. Published in separate editions for each of the official languages of the Member States, the brochures provide details on Euro-Info Centres, the BRE and BC-Net networks, EURO-PARTENARIAT, INTERPRISE, ADAPT, CRAFT, the European Investment Bank, Seed Capital funds and a range of SME initiatives. Each brochure provides national and local contacts where possible.

Contact: DG XXIII
Fx. +32 2 299 27 69

■ SCIENCE PARKS

The development of Science Parks has been an important feature of recent decades and the "Science Park" experience has been adopted, with different approaches, in several European countries. Are Science Parks a 'fashion' or do they respond to real needs in less-favoured regions of the European Union? This is the question addressed in the conference on "RTD potential in the Mezzogiorno of Italy: the role of Science Parks in a European perspective", held in Italy on 21-22 September 1995. The proceedings are now available in English and Italian.

The conference, funded by the European Commission,

provided an opportunity to discuss RTD and technology transfer actions in less-favoured regions, taking science parks in the Mezzogiorno of Italy (Southern Italy) as a starting point. The conference presented examples from the Netherlands, Spain, Germany and France and gave an overview of the role of science parks globally, with special emphasis on the United States and Asian countries.

Contact: European Commission, DG XII

Fx. +32 2 296 05 60

E-m. rosanna.d'amario@dg12.cec.be

■ PROMOTING EU R&D PROGRAMMES

The Finnish EU R&D Office (TEKES) has published the results of a study of methods used in different EU Member States for the promotion of EU R&D programmes. The study is based on interviews with Innovation Relay Centres, Euro-Info Centres, CRAFT Focal Points, and other consultants and organisations promoting EU R&D programmes, as well as companies and research institutions participating in them. The countries studied were Finland, France, Germany and the Netherlands.

The book analyses the different promotion methods used. Available in English only, it discusses the major problems of participation in EU RTD programmes, and, in particular, the possibilities for participation by the construction in-

dustry. It is aimed at organisations promoting EU RTD and at any companies or research institutions interested in participating.

Contact: Finnish Secretariat for EU R&D (TEKES)

Fx. +358 10 521 5908

E-m. Eurotutkimus@tek.es.fi

N O T E

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (1/97). Publications are free unless otherwise stated.

CD-AJ-97-002-EN-C

CORDIS focus Supplements

RTD and Innovation Support for SMEs

First published last October and now available in English, French and German, this supplement provides a useful overview of European Commission actions designed to help SMEs participate in and benefit from EU research and innovation activities.

It is divided into three sections. The first outlines the EC's current position and future plans regarding SMEs. Section 2 provides detailed coverage of actions initiated by DG XII (Science, Research and Development) and DG XIII (Telecommunications, Information Market and Exploitation of Research).

Section 3 outlines a range of EC networks and information sources for SMEs at national and regional level. The supplement provides plenty of information in an accessible and easy-to-read format, with case studies and answers to SMEs' most frequently asked queries.

EU Research Programmes and Related Activities

Published in January, this *CORDIS focus* supplement provides an overview of EU programmes and other activities of interest to European researchers. Covering almost 120 initiatives and actions in total, each entry includes a brief summary of the aims and activities together with contacts for further information. If you want a quick reference guide to programmes, acronyms, Commission services and programme funding, this publication is invaluable.

Contact: RTD Helpdesk

Fx. +352 4301 32084

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