

# European Investment Bank

## Information

### BEI | EIB



Den europæiske Investeringsbank  
Europäische Investitionsbank  
Ευρωπαϊκή Τράπεζα Επενδύσεων  
Banque Européenne d'Investissement  
Banca Europea per gli Investimenti  
Europese Investeringsbank

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## EIB financing reaches almost 6 billion ECUs in 1983

Financing operations carried out by the European Investment Bank to help economic development in the EEC Member States and in other countries linked to the Community, mainly in the developing world, grew to almost 6 billion ECUs in 1983. This is an

overall 27% rise on the previous year (4.7 billion) or 20% in real terms, i.e. after allowing for the effects of inflation.

Key features of the Bank's operations in the Community (almost 5.5 billion ECUs) during 1983 included:

■ a concentration of lending for investment in problem regions; over 60% went to areas lagging behind in their development or needing to tackle serious industrial decline, and confronted with high unemployment;

■ a substantial rise in lending for industrial modernisation, marked mainly by a considerable increase in providing finance for small and medium-scale ventures — some 3 250 were helped to set up, expand or modernise (1983 was the European Year of the Small and Medium-scale Enterprise); there was an accent on improving firms' productivity with a higher technology input, and on reinforcing Europe's stake in several fields of forward-looking technology;

■ an expansion in lending for a broad range of investment aimed at reducing the Community's dependence on oil imports, particularly by making more efficient use of energy;

■ a strengthened commitment to environmental protection (in 1983 the Bank signed the United Nations Declaration on Environmental Policies and its loans for investment along these lines more than doubled);

■ a vigorous contribution from **New Community Instrument** resources: 1.2 billion of the total came from these funds, which the EIB lends on the Community's behalf for investments furthering specific objectives — currently mainly to help investment by small and medium-scale firms and bolster energy development.

The EIB's activities have grown steadily since 1977 when the European Council called for increased Community action to support investment, combat unemployment and reduce disparities between national economic performances. Lending in 1983, including New Community Instrument loans, was some 110% up in real terms on the amount lent in 1977.

Three months ago the EIB organised an international symposium in Luxembourg entitled "Investing in Europe's future", and sponsored a book with the same title written by leading economists, to stress the urgency of fostering recovery of investment in the EEC.

**Outside the Community:** 1983 saw the Bank pursuing its financing under Community agreements to assist economic development in Portugal and Spain in preparation for their accession to the EEC.

The EIB helped to fund development aid projects in over 25 other countries. In the Mediterranean region there was an increase in activity with funds going to development in Yugoslavia and the start of lending under the new financial protocols to the EEC's cooperation agreements with Morocco, Egypt, Jordan and the Lebanon.

In African, Caribbean and Pacific countries — signatories to the second Lomé Convention — the rhythm

of lending was less pronounced. Investment slowed as a result of the difficult economic and financial situation of the ACP countries, many of them afflicted also by adverse climatic conditions.

In total, the Bank's operations outside the Community amounted to 480 million ECUs.

**Borrowings** which the EIB made during the year to resource its lending operations came to the equivalent of some 3.6 billion ECUs, a 13% rise on 1982's total; the funds were raised mainly through public bond issues. Community currencies represented just over half the borrowings headed by the Deutsche Mark (almost 20%) and the guilder (10.5%). There was also a marked increase in borrowings in ECU. Non-Community currencies were, as before, headed by United States dollars (over 25%) but the yen rose to almost 13% of borrowings.

### Strengthened support

The EIB was able to strengthen its support for priority investments in Europe.

There was a significant expansion of lending in Italy (up 28%) and France (almost doubled), a strong recovery of activity in the United Kingdom (up 40% after a slack 1982), and appreciable rises in Denmark and Germany;

**A new lease of economic life for Europe?** by Prof. J.H.P. Paelinck,  
Director, Netherlands Economic Institute: p. 7 - 12.

in Greece activity held more or less steady, but in Ireland demand for loans dropped somewhat.

Projects supported during the year involved an estimated 18 billion ECUs of new fixed investment in the EEC (about 12 billion in 1982), with the loans therefore contributing some 30%. Finance was heavily concentrated in those parts of the Community with the most severe structural problems: for example loans in Greece can be calculated as corresponding to about 5.8% of gross fixed capital formation during the year, in Ireland 6.9% and in the Italian Mezzogiorno 8%.

Estimates are that investments supported by the EIB in 1983 should lead to the direct creation of some 33 500 jobs, mainly in industry. There is also the aspect of safeguarding employment: loans for modernisation in industry, principally in smaller scale ventures, have helped to improve productivity and strengthen firms employing about 195 000 people. Moreover, there are the temporary employment effects during construction (often for lengthy periods) and in the supply of necessary services and materials — this mainly concerns large-scale energy and infrastructure works. The total effect of projects assisted in 1983 should be equivalent to 480 000 man-years of work, which corresponds to some 145 000 jobs through 1983 and 1984, with progressively fewer thereafter. If similar calculations made in earlier years are taken into account, it can be estimated that work on projects which the EIB has backed with its own and NCI funds have helped to maintain the jobs of 475 000 people during 1983.

## ECU

Below are the ECU's values in national currencies, as at 30 December 1983; these rates are applied to the present quarter in preparing financial statements and operational statistics of the Bank:

DM	2.25748	Bfrs	46.0969
£	0.570600	Lfrs	46.0969
Ffrs	6.90358	Dkr	8.18269
Lit	1 371.99	Dr	81.7773
FI	2.53713	IR£	0.728961
		US\$	0.827370

N.B.: ECU/national currency conversions given in this article for operations in 1983 are based on different exchange rates, applicable at the time of each contract signature.

## Regional development

Main thrust of the Bank's lending was to help **regional development**, a priority established for the Bank by the Treaty of Rome. Over 3.3 billion ECUs concerned investment in assisted areas which are lagging behind in their development or undergoing severe conversion problems.

High unemployment zones benefited the most: 75% of the lending went to areas where the jobless figures are 25% or more above the Community average.

Seen in a different way, Ireland, the Italian Mezzogiorno, Greece, Northern Ireland and Greenland — which are recognised by the Community as having particularly serious regional development problems — accounted for over 70% of the lending.

Regional financing was focused on infrastructure needed to improve conditions for development, in particular:

- expanding and up-dating telecommunications in line with modern technology, and development of transport facilities, which took roughly a third of the total;
- strengthening of electricity and gas supplies in the regions;
- sewerage, water supply and irrigation schemes (many of the sewerage schemes were also important in reducing pollution);
- layout and improvement of industrial zones;
- reconstruction work in areas of Southern Italy damaged by earthquakes in 1980.

A feature of particular interest was the granting of global loans to financial institutions in Greece and France to support a series of local infrastructure works (e.g. secondary road improvements, harbour works, lighting and drainage schemes) which would normally be too small for the EIB to deal with directly.

Over a quarter of regional financing went to industry, and also agriculture and services, mainly in the form of global loans to assist small and medium-scale ventures in assisted areas.

## Industry

One of the major developments in 1983 was the increase in financing productive investment — mainly in industry — which rose to 1 565 million ECUs (1 300 million in 1982).

There was a more than 40% increase in global loans to banks and other financial institutions to on-lend in credits for small and medium-scale investments. In fact, nearly 3 250 credits went out during the year to help firms set up, expand, modernise, or make more efficient use of energy. This compares with about 1 200 credits in 1982, and 860 credits in 1981.

Over half these smaller scale investments were carried out in assisted areas, so contributing to regional development. But the big difference in 1983 was the launching of New Community Instrument global loans in Denmark, France, Italy and the United Kingdom specifically earmarked to help small and medium-scale firms in non-assisted areas.

The EIB attaches particular importance to expansion of global loan facilities, channelling funds to a stratum of modest-sized industry which it would be difficult for the Bank to deal with directly. Roughly a third of the firms assisted via global loans last year were concerns with under 20 employees; more than 60% had less than 50. About 525 credits went to set up new enterprises.

The European Council has repeatedly stressed the importance of supporting investment by small and medium-scale firms, particularly those with high innovative potential, adopting advanced technology in their production processes or manufacturing high technology goods or components.

Unfortunately, the thrust of extra financing to SMEs was partially offset by a drop in loan demand for larger industrial projects. This came to slightly more than 370 million ECUs (460 million in 1982), although there was an encouraging element in the kind of investment financed, as several of the projects were in forward-looking sectors, especially electronics and their application in machine tools and industrial robots.

## Energy

Another main EIB objective is to support Community aims to reduce oil import dependence by:

- improving efficiency in energy utilisation;
- development of Europe's own energy resources;
- diversifying that part of energy consumption which has to be met by imports away from oil to other fuels, e.g. natural gas or coal.

The Bank estimates that projects of this kind that it financed during 1983 — once all are fully operational — should serve to **replace 22 million tonnes of oil per year.**

Taking the calculation back to 1977, the Bank has contributed (on its own and NCI resources) to energy investments with a combined potential impact on oil imports of some 100 million tonnes of oil per annum. As a comparison, this is equivalent to over 20% of the Community's oil import total in 1978 (470 million tonnes).

The energy sector as such — i.e. the production and transmission of energy — took over 1 680 million ECUs, about 50% up on 1982's level.

Almost 1 billion went to energy production. Projects concerned construction of coal-fired, hydro and geothermal power stations, conversion of oil-burning plant to coal-firing, development of gas and oil fields and lignite mining. Demand for funds to finance nuclear plant continued at a lowish level (about 440 million ECUs, much the same as in the previous year, whereas financing totalled some 700 million in 1981).

The main area of growth in energy sector financing (more than tripling compared with the previous year to about 700 million ECUs) lay on the transmission side, with key stretches of pipelines to reinforce the integration of the European gas networks, and power line projects, including the under-Channel link being laid between the French and British grids. There was also an expansion in global loans for funding mixed smaller infrastructure works leading to a more rational use of energy.

In fact, this last aspect — the general promotion of more efficient energy consumption — has grown steadily in importance over the last few years. Counting all the loans and global loan credits for industry's energy rationalisation, the total which the EIB has directed into energy efficiency investment over the past five years amounts to more than 2 billion ECUs, of which over 610 million in 1983.

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#### **Environment, European transport**

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Two other European aims adhered to by the European Investment Bank are environmental protection and developing European communications.

1983 saw loans for environmental protection and preservation of cultural heritage rise to about 130 million ECUs (against 60+ million in 1982 and 20+ million the previous year). Funds went to installations to deal with effluent problems in the Bay of Naples, and the River Tiber and coastal zone near Rome, as well as similar projects to reduce effluent pollution at different points on the Greek and Danish coasts. A loan was also made for restoration and protection of the Doge's Palace in Venice, Italy's third main tourist monument; part of this loan was awarded an interest subsidy from the Community budget.

European communications were supported with loans worth about 125 million ECUs, split between completion of a stretch of the Friuli motorway (link between Italian, Austrian, and by extension, German motorway systems), expansion of Birmingham airport in the UK (60% of traffic is to and from other European countries), and strengthening of the Air France fleet by purchase of five new jetliners for use on intra-Community routes.

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#### **Country breakdown**

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In **Italy** loans totalled over 2 610 million ECUs (Lit 3 515 billion), up 28% on 1982. Some 60% — 1 590 million ECUs (Lit 2 140 billion) — went to investment in the Mezzogiorno, and this included 270 million ECUs (Lit 365 billion) earmarked specifically for reconstruction of the earthquake-devastated regions in Basilicata and Campania.

Over a third of the loans in Italy — worth about 925 million ECUs (Lit 1 240 billion) — carried a 3% interest subsidy paid from the Community budget under both arrangements agreed when Italy joined the European Monetary System, and measures to help the earthquake-hit zones.

Lending to the productive sector grew by almost 30% during the year, reaching some 1 040 million ECUs (Lit 1 400 billion). Over two-thirds of this was in the form of global loans destined for small and medium-sized investments principally in industry, including equipment to improve energy efficiency. During the year about 1 500 credits were provided from such global loans.

Larger industrial projects supported by the Bank included substantial investment in the car industry; for example introduction of advanced

automation in factories in Piedmont. Several other high technology projects were supported, such as a biotechnology-based plant near Milan for the production of antibiotics, manufacture in Campania of optical fibres for telecommunications, production of data and word-processing systems at factories in Piedmont, and manufacture of automated production lines by a company in Emilia Romagna.

In the energy sector lending totalled close on 500 million ECUs (Lit 660 billion), nearly double the 1982 level. Funds were made available for development of oilfields both onshore and offshore in the Adriatic, ongoing work on the Algeria-Italy gasline, natural gas underground storage, construction of geothermal and hydro-electric power stations and conversion of an oil burning power station to coal-firing, as well as for restructuring refineries (achieving energy economies), the construction of the Alto Lazio nuclear power station, and improvements to electricity transmission and distribution networks, including an undersea cable linking Sicily to the mainland grid. Global loans were granted to finance smaller-scale infrastructure works such as hydro-electric installations, district heating and natural gas networks.

For better communications, loans worth almost 420 million ECUs (Lit 560 billion) went to improve and extend telecommunications, construction work on the Friuli motorway (connected with the Austrian and German motorway grid) plus motorway, road, railway and telecommunications repair work in the earthquake-hit areas.

Other activity included loans for water supply and sewerage projects with treatment schemes to reduce pollution in the Gulf of Naples and River Tiber at Rome; irrigation in Molise and South Latium; layout of industrial estates in the earthquake areas and repairs to damaged university and other public service buildings, sewers, and construction of an operational base for civil defence and emergency services. A loan was granted for restoration of the Doge's Palace, Venice.

Lending in **France** practically doubled to almost 895 million ECUs (some Ffrs 6 090 million).

Over 40% — about 380 million ECUs (over Ffrs 2 600 million) — went into infrastructure improvements, much in the form of global loans to provide credit for small and medium-scale works assisting regional develop-

4 **The pattern of lending within the Community from EIB own and NCI resources in 1983 and 1982**  
Breakdown by location, economic policy objective and sector

	1983				1982				Increase/decrease 1983/1982	
	million ECUs				million ECUs				%	
	Own resources	NCI	Total	%	Own resources	NCI	Total	%	Own resources	Total
<b>LOCATION</b>										
Belgium	—	—	—	—	60.5	—	60.5	1.4	—	—
Denmark	259.7	105.4	365.1	6.7	209.3	96.0	305.3	7.2	+ 24	+ 20
Germany	152.2	—	152.2	2.8	20.8	—	20.8	0.5	+631	+631
Greece	364.3	85.3	449.6	8.2	333.6	124.9	458.5	10.8	+ 9	— 2
France	707.9	186.2	894.1	16.4	424.3	37.6	461.9	10.9	+ 67	+ 94
Ireland	234.6	69.4	304.0	5.6	325.4	83.1	408.5	9.6	— 28	— 26
Italy	1 945.7	665.4	2 611.1	47.7	1 588.7	449.4	2 038.1	48.0	+ 22	+ 28
United Kingdom	591.3	100.1	691.4	12.6	490.6	—	490.6	11.6	+ 21	+ 41
<b>Total</b>	<b>4 255.7</b>	<b>1 211.8</b>	<b>5 467.5</b>	<b>100.0</b>	<b>3 453.2</b>	<b>791.0</b>	<b>4 244.2</b>	<b>100.0</b>	<b>+ 23</b>	<b>+ 29</b>
<b>ECONOMIC POLICY OBJECTIVE</b>										
<b>Regional development</b>	<b>2 843.2</b>	<b>507.5</b>	<b>3 350.7</b>	<b>61.3</b>	<b>2 626.4</b>	<b>467.3</b>	<b>3 093.7</b>	<b>72.0</b>	<b>+ 8</b>	<b>+ 8</b>
<b>Common European interest/modernisation-conversion of undertakings</b>	<b>1 922.1</b>	<b>830.9</b>	<b>2 753.0</b>	<b>50.3</b>	<b>1 440.2</b>	<b>466.9</b>	<b>1 907.1</b>	<b>44.9</b>	<b>+ 33</b>	<b>+ 44</b>
energy objectives (1)	1 505.9	315.4	1 821.3	33.3	1 210.5	131.4	1 341.9	31.6	+ 24	+ 36
communications, environment and other Community infrastructure	223.1	30.2	253.3	4.6	165.9	105.3	271.2	6.4	+ 34	— 7
modernisation and conversion of undertakings	193.1	485.3	678.4	12.4	63.8	230.2	294.0	6.9	+203	+131
deduct (2)	-509.5	-126.6	-636.1	-11.6	-613.4	-143.1	-718.9	-16.9	—	—
<b>SECTOR</b>										
<b>Infrastructure</b>	<b>3 179.5</b>	<b>722.7</b>	<b>3 902.2</b>	<b>71.4</b>	<b>2 413.1</b>	<b>529.7</b>	<b>2 942.8</b>	<b>69.3</b>	<b>+ 32</b>	<b>+ 33</b>
energy	1 402.5	279.0	1 681.4	30.8	1 043.2	100.3	1 143.5	26.9	+ 34	+ 47
communications	1 041.9	82.9	1 124.8	20.5	830.1	228.6	1 058.7	24.9	+ 25	— 6
water schemes	255.5	—	255.5	4.7	324.7	120.8	445.5	10.5	— 21	— 43
other	204.5	293.0	497.5	9.1	153.7	80.0	233.7	5.5	+ 33	+113
global loans	275.1	67.8	342.9	6.3	61.4	—	61.4	1.5	+348	+459
<b>Industry, agriculture and services</b>	<b>1 076.2</b>	<b>489.1</b>	<b>1 565.3</b>	<b>28.6</b>	<b>1 040.1</b>	<b>261.3</b>	<b>1 301.4</b>	<b>30.7</b>	<b>+ 3</b>	<b>+ 20</b>
individual loans (3)	368.5	3.8	372.3	6.8	447.2	12.2	459.4	10.8	— 18	— 19
global loans	707.7	485.3	1 193.0	21.8	592.9	249.1	842.0	19.9	+ 19	+ 42
<b>Allocations from current global loans</b>	<b>(697.8)</b>	<b>(518.8)</b>	<b>(1 216.6)</b>	<b>(22.3)</b>	<b>(518.4)</b>	<b>—</b>	<b>(518.4)</b>	<b>(12.2)</b>	<b>(+ 35)</b>	<b>(+135)</b>
industry	(560.8)	(482.4)	(1 043.2)	(19.1)	(453.5)	—	(453.5)	(10.7)	(+ 24)	(+130)
infrastructure	(137.0)	(36.4)	(173.4)	(3.2)	(64.9)	—	(64.9)	(1.5)	(+111)	(+167)

(1) development of indigenous resources, diversification of imports and rational use of energy (RUE), excluding energy-related capital investment contributing more to regional development than to attainment of the Community's energy objectives as such.  
(2) to allow for duplication of financing justified on the basis of several objectives.  
(3) including certain RUE loans.

ment, e.g. improvements to the secondary road system and local power lines. Larger transport projects supported during the year included improvements to the Bordeaux ring-road, and road improvement schemes in West and South West France, Lorraine and Corsica. Loans went to construction of a coal terminal at Montoir-de-Bretagne on the Loire Estuary to provide supplies for power stations, the modernisation and expansion of the regional telephone network in Nord-Pas-de-Calais and the national telecommunications trunk system, particularly in the West and South-West regions, and also for purchase of five new aircraft by Air France.

Almost all the financing for industrial development (total almost 260 million ECUs/Ffrs 1 770 million) went as global loans, and during the year over 1 360 credits were drawn to finance smaller-scale productive investments throughout the country. At the same time, global loans for financing more efficient use of energy in industry, public buildings and infrastructure, gave rise to a further 230 credits. There was also a loan for modernising a drop-forge steel mill at Ariège.

Energy sector developments totalled over 250 million ECUs (Ffrs 1 710 million) with loans backing a wide range of projects. These included work on laying a 2 000 MW cable linking the French and British electricity grids under the English Channel; the development of a lignite mine near Aix-en-Provence, and expansion of a nearby power station to burn the fuel; modernisation of a coal-fired district heating system near Lyon, and development of geothermal resources for a district heating system in Seine-et-Marne; construction of nuclear plant (Flamanville near Cherbourg, and NERSA, Rhône Valley, power stations).

In the **United Kingdom** lending rose by over 40% to more than 690 million ECUs (slightly over £ 410 million). A substantial increase in industry's take-up of funds plus demand from the energy sector were mainly responsible.

Industry took over 120 million ECUs (£ 70 million) principally in the form of global loans for onlending to small and medium-scale ventures; the Bank also supported a major project in Northern Ireland — development of a new aircraft production line in Belfast — and dairy modernisation, also in Belfast, as well as a glassworks in Nottinghamshire.

Energy financing totalled 300 million ECUs (£ 180 million) and went towards the UK end of the cross-Channel link with the French electricity grid; development of the Magnus North Sea oil field and a section of the North Sea oil and gas pipeline grid linking Magnus and other fields; construction of the nuclear power station at Torness, East Lothian, and improvement of effluent treatment and disposal facilities at Sellafield, Cumbria.

Infrastructure improvements — mainly to support regional development — took over 270 million ECUs (£ 160 million). Funds went towards modernisation and extension of telecommunications in Scotland and Hull; expansion of Manchester and Birmingham airports; coal handling equipment at Workington harbour, Cumbria; road improvements in Devon, Lancashire, Merseyside, Lothian, the Western Isles and South Wales. Other infrastructural works included water and sewerage facilities, improved coastal defences, construction of small industrial units — carried out in Humberside, Lancashire, Northumbria, Tyneside, Strathclyde, the Western Isles and South Wales — and two interesting methods of dealing with waste disposal: a refuse-burning plant for a district heating system in Newcastle-upon-Tyne and a plant at Hull to compact rubbish into fuel for industrial boilers.

**Greece**, in its third year of Community membership, saw EIB financing operations amount to about 450 million ECUs (over Dr 35 billion), a 19% increase in Drachma, but in ECUs approximately the same amount as in 1982.

Infrastructure works assisting regional development accounted for more than half — almost 245 million ECUs (Dr 19 billion). Communications improvements were a prime objective with loans going to widespread improvements to the national and provincial road networks and the Patras-Olympia highway, and extension and modernisation of telecommunications. Work on sewerage schemes, many of which will have a significant impact in reducing pollution, were carried out near Athens, in Thessaloniki, in Volos and other smaller towns, and in Crete. Loans also went to back irrigation schemes in the Boida-Mavri and Konitsa plains, Epirus, and on the South-Eastern coast of Crete, as well as to equip and extend industrial estates in the Thessaly, Epirus, Macedonia, Thrace and Peloponnese regions.

Two global loans were granted for financing mixed small-scale infrastructure works in less developed regions.

Energy investment took close to 145 million ECUs (over Dr 11 billion). Funds went to construction of hydro-electric power stations (total 780 MW) in Epirus, West Central Greece, and South Macedonia; for a 600 MW thermal power station in Western Macedonia and associated working of a nearby lignite mine to fuel the plant. The Bank also funded energy saving improvements at a refinery complex.

Industrial and agricultural development were supported through global loans for financing small and medium-scale ventures, and for farm investments and local irrigation works.

In **Denmark** lending rose 20% to more than 365 million ECUs (Dkr 2 955 million).

Energy investment absorbed over 85%, almost 320 million ECUs (Dkr 2 575 million). Loans went to bring natural gas from the Danish sector of the North Sea to the mainland, to integrate the Danish gas transmission system with the rest of the European gas grid by linking up with the German network, construction of gas treatment plants, and compressor stations, and the supply of natural gas to the Island of Funen; a pipeline bringing oil from North Sea fields to Jutland; improvements to a district heating grid at Esbjerg, South West Jutland; and for utilising heat from a waste incinerator on Falster Island. Global loans were made to back small-scale local infrastructure works focusing on energy production and distribution, particularly district heating systems.

Industrial development was supported mainly through global loans for small and medium-scale productive investments throughout the country and to encourage energy saving by firms. There was also a loan for warehouse construction in Greenland. Other projects funded during the year were sewage treatment works at Kalundborg (of European significance because it promotes objectives of the Helsinki Convention to reduce pollution in the Baltic Sea) and harbour improvements at Bornholm Island.

In **Ireland**, lending totalled almost 305 million ECUs (about IR£ 220 million). Nearly 80% — 240 million ECUs (about IR£ 170 million) — was provided with an interest subsidy of 3% under the European Monetary

System arrangements. The year's lending showed a drop of 26% on the 1982 level, largely reflecting government policy on public expenditure controls.

Three quarters of the loans, 220 million ECUs (IR£ 158 million), went into infrastructure improvements, the majority in communications: modernisation and extension of telecommunications; major road improvements including urban relief and by-passes in the Dublin and Cork areas; electrification of the Dublin suburban railway. Water supply and sewerage projects were assisted in many areas.

In the energy sector, loans went towards Ireland's first large coal-fired power station in County Clare, and extensions to the national electricity grid. Industrial development was backed by loans for construction or extension of advance and custom-built factories in the West of Ireland and global loans granted to help small and medium-scale industrial ventures, improve tourism facilities and support on-farm investments.

One new aspect: the EIB agreed to make its first global loan to a commercial bank in Ireland — the Bank of Ireland — which will come into operation this year.

In **Germany**, financing totalled over 150 million ECUs (about DM 345 million). About 130 million ECUs (DM 295 million), nearly 60% of which in the form of guarantees from the EIB to enable loans to be obtained from other sources, went to energy projects; nuclear power stations at Philippsburg and Gundremmingen, and an East-West gas-line across Germany to supply gas from the Soviet Union to both German and French consumers. A guarantee was provided for a loan for a central coking plant in the Saar, and loans were made for developments at a pharmaceutical concern and a new hotel in Lower Saxony.

#### Operations outside the Community

EIB financing operations in countries outside the Community came to just over 480 million ECUs in 1983, compared with about 450 million in 1982. This was made up of some 430 million from the Bank's own resources (covered by special Community guarantees) and 50 million in finance from budgetary funds which the Bank manages on the Community's behalf (primarily risk capital

from the European Development Fund to help industrial development in African, Caribbean and Pacific countries).

About 40% of the total lent outside the EEC — 190 million ECUs — went to investment in the Community candidate countries, Spain and Portugal. Loans also helped development in five other Mediterranean basin countries, 18 African, Caribbean and Pacific states under the Lomé Convention, and 3 Overseas Countries and Territories.

#### SPAIN AND PORTUGAL

In **Spain**, 105 million ECUs were made available as part of the Community's pre-accession financial co-operation arrangements. Two thirds went as global loans for small and medium-scale industrial and tourism ventures, and local public infrastructure works in the less developed regions. Larger projects assisted during the year concerned improvements to important railway links between the port of Gijon and Leon,

and basic infrastructure improvements (roads, electrification, waste disposal plants and tourist facilities) in Andalusia.

In **Portugal**, the Bank provided loans totalling 85 million ECUs, as part of the Community's pre-accession aid package, for investments in airport improvements at Oporto and Faro, up-rating of a coal-fired power station and as global loans for small-scale investments in industry and tourism, including measures to achieve energy savings.

#### MEDITERRANEAN

In **Yugoslavia** the Bank helped to finance five sections of the trans-Yugoslav highway, a project very much to the benefit of the EEC as well as Yugoslavia, since the highway will improve communications between Greece and other Member Countries, and give the Community as a whole speedier access to Turkey and the Middle East. The loan was worth some 67 million ECUs.

#### Operations in the ACP and OCT in 1983

	Loans from own resources	Risk capital operations	Total	(in million ECUs)		
				Sectors		
				Industry	Energy	Infrastructure
<b>Africa</b> .....	<b>88.00</b>	<b>42.26</b>	<b>130.26</b>	<b>77.26</b>	<b>28.00</b>	<b>25.00</b>
Botswana .....	4.00		4.00	4.00		
Cameroon .....	25.00	0.40	25.40	0.40	25.00	
Central African Republic .....		5.10	5.10	5.10		
Congo .....	4.00	0.48	4.48	4.48		
Ivory Coast .....		2.43	2.43	2.43		
Djibouti .....		0.05	0.05	0.05		
Gabon .....		2.50	2.50	2.50		
Ghana .....		6.00	6.00	6.00 <sup>(1)</sup>		
Madagascar .....		5.00	5.00	5.00		
Malawi .....		3.40	3.40	0.40	3.00	
Nigeria .....	40.00		40.00	40.00		
Rwanda .....		0.70	0.70	0.70		
Senegal .....		0.50	0.50	0.50		
Soudan .....		0.20	0.20	0.20		
Zimbabwe .....	15.00	5.00	20.00	5.00		15.00
Regional						
West Africa .....		10.00	10.00			10.00
East Africa .....		0.50	0.50	0.50		
<b>Caribbean</b> .....	<b>2.00</b>	<b>0.60</b>	<b>2.60</b>	<b>2.60</b>		
Belize .....	2.00	0.60	2.60	2.60		
<b>Pacific</b> .....	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>			<b>2.00</b>
Kiribati .....		0.20	0.20			0.20
Papua-New Guinea .....		1.80	1.80			1.80
<b>Total ACP</b> .....	<b>90.00</b>	<b>44.86</b>	<b>134.86</b>	<b>79.86</b>	<b>28.00</b>	<b>27.00</b>
<b>OCT</b> .....		<b>2.70</b>	<b>2.70</b>	<b>2.70</b>		
Falkland Islands .....		0.20	0.20	0.20		
St. Kitts-Nevis .....		1.00	1.00	1.00		
French Polynesia .....		1.50	1.50	1.50		
<b>Total</b> .....	<b>90.00</b>	<b>47.56</b>	<b>137.56</b>	<b>82.56<sup>(2)</sup></b>	<b>28.00</b>	<b>27.00</b>

<sup>(1)</sup> mining project

<sup>(2)</sup> including 59.35 million ECUs in support for development banks (Botswana, Congo, Djibouti, Nigeria, Rwanda, Zimbabwe, regional bank in East Africa, Belize, St. Kitts-Nevis, and French Polynesia)

In **Morocco** a total of 36 million ECUs went towards extending petroleum handling facilities at the port of Mohammedia and in building a dam in the High Atlas to serve irrigation, water supply and hydro-electric needs.

In **Egypt** a 25 million ECUs global loan went to finance small and medium-scale industrial ventures.

A total 20 million ECUs (of which 5.5 million ECUs from budgetary resources) financing in **Jordan** went towards improvements and extensions to the electricity distribution network in Amman, and as global loans for small and medium-scale industrial, tourism, craft and on-farm investments.

In **Lebanon**, 5 million ECUs went towards equipping a thermal power station.

#### **ACP COUNTRIES**

Since the beginning of the first Lomé Convention in 1976, the EIB has carried out financing operations in 54 signatory states in Africa, the Caribbean and the Pacific, as well as several Overseas Countries and Territories (OCT) which benefit from similar aid provisions.

The Bank's operations last year extended to 18 ACP countries plus three OCT and totalled close on 140 million ECUs (90 million from the

Bank's own resources, the rest in risk capital from budgetary funds). The relatively low level of new lending reflects the impact of the world economic situation on the ACP generally, and the additional hardship arising — in many cases — from harsh climatic conditions. These have restricted development, and led to increasing delays in project preparation.

Manufacturing industry took more than half of the total lent in 1983. This was mainly in the form of global loans to development finance companies to support small-scale investments, usually making the most of local products, and to enable the dfcs to finance small feasibility studies on industrial development proposals.

Energy came next, with more than 20% of the funds, essentially for hydro-electric schemes which will help several ACP countries meet their rising energy needs without worsening their oil import burden. Loans also went to telecommunications and shipping improvements, mining development and several feasibility studies on mining and energy investment proposals.

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#### **EIB borrowing operations in 1983**

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The European Investment Bank raised just over 3.6 billion ECUs on

the capital markets in 1983 as against 3.2 billion the previous year. (N.B. borrowings to resource the New Community Instrument are separate and are made in the name of the European Economic Community).

Nearly 64% of the EIB's borrowings — over 2.3 billion — was through public bond issues. Private placements secured about 1.2 billion, while slightly over 110 million came from the sale to third parties of participations in EIB loans, guaranteed by the Bank.

Borrowings were concluded for just over half the total in Community currencies, including the ECU:

— Deutsche Mark 19.9% (equivalent 721 million ECUs), guilder 10.5% (380 million ECUs); ECUs 6.4% (230 million); pound sterling 4.8% (176 million ECUs); Belgian francs 4.4% (161 million ECUs); French francs 4.1% (149 million ECUs); Luxembourg francs 1% (35 million ECUs);

and in non-Community currencies:

— United States dollars 25.1% (908 million ECUs); yen 12.9% (468 million ECUs); Swiss francs 7.9% (285 million ECUs); Canadian dollars 2.1% (76 million ECUs); Schillings 0.9% (32 million ECUs).

## **A new lease of economic life for Europe?**

by Professor J.H.P. Paelinck\*

Although there have been signs of late of an improvement in the economic situation, one thing Europe does not lack is forebodings about its long-term future. We are still being assailed by reports of Japanese imports and the steps being taken to contain them. Over the longer term, we are confronted with the fact that, between 1970 and 1980, the United States managed to create 21 million jobs while we in Europe achieved only 400 000. Indeed, over a longer period still - 1963 to 1983 - they notched up several dozen million new posts while we were in the process of losing a round million.

Statistics like these and other glaring facts — in 1981, Europe's technology balance with the rest of the world was in deficit; Philips is to include the Japan-

ese VHS system in the range of videotape recorders it produces — beg the question: in what direction can Europe develop over the years to come — in what direction must it develop? Which way, in other words, should we steer production to gain a new lease of economic life, for the countries of the European Community, and what should be the main thrust of our future investment policy, remembering not least just how much investment has declined over the last ten years? The problem of steering productive activity in EEC countries into new growth was an apt choice of theme by the European Investment Bank for its 25th Anniversary Symposium (November 83), when it commissioned a Netherlands Economic Institute (NEI) study on potential future European investment strategies.

The problem is anything but simple; there are no ready solutions. By what yardstick can the effectiveness of guidelines for future production be measured? How might we choose between any that appear promising? One of the things very much to be borne in mind would be

those trumps that the countries of the EEC might be able to play in answer to the stakes put up by the Americans and the Japanese, the "big bidders" in the world trade game. This article is an attempt to explore one of the possible approaches to this problem, and to

come up with various conclusions of concrete operational value.

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\* Professor J.H.P. Paelinck, Director of the Netherlands Economic Institute headed the team that conducted the study, of which this article is a resumé. For information on the full 3-volume study contact the EIB Documentation and Library Division.

## Future activity

Clearly, the first question to be tackled is that of establishing which activities actually hold promise: the serious business of restructuring potential in the agricultural, industrial and service sectors in the years to come.

Economists have identified various sources of information. Firstly, there is international trade, and in particular statistics on relative rates of expansion in world markets: information from that quarter, although valuable, does have its limitations — it relates only to the past, and does not necessarily lend itself to extrapolation; it is confined to products (omitting services, on which there is a relative dearth of statistics) and only covers part of productive or consumption activity, inasmuch as it stems from particular factors, especially those which dictate comparative advantages in international trade.

Hence the need to supplement information from these sources by studies and statistics directly connected with the probabilities for the expansion of certain types of production. This in fact means

economic studies with a technological bias, calling for more direct knowledge of the activities in question. Experts with a specialist interest in given types of products and services are in a position to predict which areas of production are likely to attract the most effort in the future and what market potential exists in research and development laboratories and services. This sort of information can be confirmed by analysis of those categories of goods and services that have come to be dubbed "leading edge", i.e. those which feature or deploy the latest, most promising technological developments.

This involves a very delicate sifting process: the critical assessment of economic and technological findings and a modicum of the most objective possible appraisal of those very few hard facts that can be picked out of all the wealth of literature that exists. The following table is the result of a series of such sifting operations, presenting the data available for 1983 according to the "chains of distribution" in each case, i.e. showing the connections between a range of basic, physical productive activities and the ultimate service-sector activities stemming from them.

Certain remarks are in order here. Table 1 in fact systematically features those very activities that so often come up in discussions on prospects for the distant future, namely: mechanical engineering (e.g. robotics), chemicals (e.g. biotechnology) and energy (new sources). Also appearing are those services that emanate from recent developments, such as the use of microprocessors (a case in point: teleinformatics), but of still greater interest are the other elements that the tabulation brings to light. It draws a distinction between three phases (the "upstream", "intermediate" and "downstream" phases) in each of the chains identified: the component phase (e.g. microchips), the structural phase (a microcomputer is such a structure) and finally the service phase, making use of what is produced in the structural phase (e.g. teleinformatics). A further point that emerges from the schema is the distinction between product innovation and process innovation, the latter being a phenomenon apparent in both new and established activities (much mentioned, in this connection, is the introduction of robotics, or in more general terms, of FAS — flexible automation systems). Agricultural activity is not

Table 1

Chain	Phase I (upstream)	Phase II (intermediate)	Phase III (downstream)
1. Aeronautics	Aircraft components	Aircraft construction	Air transport and allied activities
2. Railways	Railway equipment components	Railway equipment manufacturing	Rail transport and allied activities
3. Energy (modern forms)	Construction of generating units	Energy distribution, District heating	Trade
4. Electronics	Components (microprocessors, bubble memories, etc.)	Office systems, Informatics, Process applications, Domestic appliances	Trade, Repairs, Telecommunications
5. Chemicals	New basic chemical combinations	Glass, Parachemical products (fibres, plastics, etc.) Pharmaceuticals	Trade
6. Mechanical engineering	Components (including 4)	Machine tools, Industrial equipment, Transport equipment, Electrical assemblies, Domestic appliances, Precision instruments	Trade, Repairs
7. Civil engineering	Materials (especially new ones: substrates, etc.)	Services to construction companies, Works	Infrastructure, Housing
8. Health	Pharmaceuticals, Equipment	Medical services	
9. Communications	Equipment	Telecommunications, Other service activities	Education, Other services



mentioned specifically, but it does of course have affinities with modern biotechnology (enzyme fertilizers and new, highly robust vegetable strains like IR-30 rice etc.).

These products, or rather, in more general terms, these new activities, have reached different stages of development in different countries around the world. Japan and the United States are frequently to the fore, but into the picture also come the "newly industrialised" countries like Hong Kong, Taiwan, South Korea, Brazil and Mexico, which are involved too in the technological treasure hunt. Just where in the field do the Community countries lie as that race, which should sweep the world economies well into the twenty-first century, gets under way? It is to that question that the following section is addressed.

### Europe's strong points

The reasons why economies should show the faster or slower rates of growth described above have been the subject of considerable research. But our immediate concern here is specific goods and services, and this calls for a novel approach, to arrive at an explanation for the positions occupied by those vying for the laurels in the world of productive enterprise. That approach is based on the idea of the "profile", i.e. quite simply a range of features pertaining to a given unit, such that the components of the profile are determined by the unit analysed and the aim of the analysis. The present study however represents a new departure, inasmuch as simultaneous use is made of two such profiles, one relating to the product and the other to the country of production: any non-congruence between the two would explain why a country might be relatively low-placed on the "league table". Equally, congruence or non-congruence between the two profiles might vary in extent according to the product under consideration: a country might be well suited to production of a certain range of goods, or it might be less so.

In constructing and quantifying this model, the object of the exercise was to arrive at an assessment of the relative importance of the components of these profiles — more details of which will be furnished presently — as means of explaining the way different countries — the United States, Japan, those of the EEC and the newly-industrialised countries — are placed in the running when it

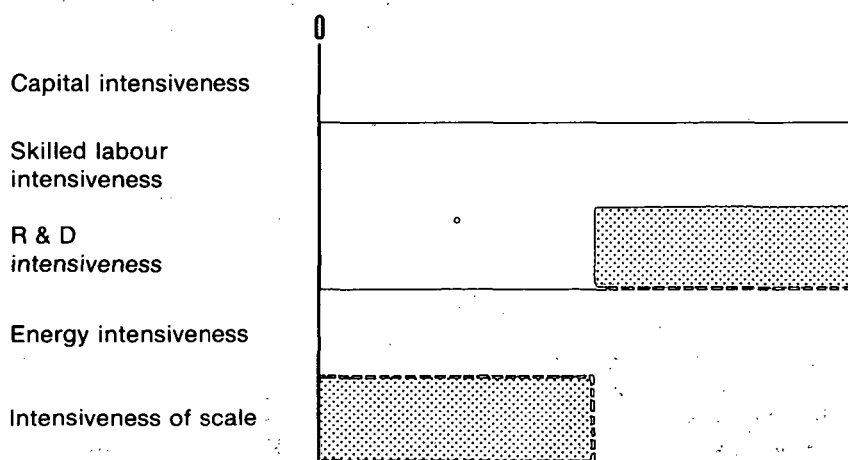
comes to the drive for new products, which was the subject of the central study. Of course, the development of this model is still at an early stage, where — hopefully, only for the time being — it remains static, or rather "comparatively static", in the sense that it endeavours to explain the relative positions occupied by the various countries for those items of production taken into consideration; at a later stage in the research, it should be possible to introduce dynamic factors that will explain movements in those relative positions over time.

This is not the place to dwell on the mathematical and econometric minutiae of this model\*, which has been applied to a range of products corresponding to the activities schematised in Table 1. The figures are those for 1980. What the exercise does is to relate to one another the following: capital intensiveness, the degree of specialisation in the activity concerned, research and development and energy intensiveness, the scale of production (secondary sector), the general level of industrial production in the country concerned, its home market, the skill level of its workforce, a "business environment risk index", the ratio of residual income to Gross Domestic Product, a research and development yardstick and the degree of self-sufficiency in energy that the country enjoys. These variables were selected partly according to the needs dictated by the study and partly on the basis of the statistics available.

Table 2 (page 10) sets out the first findings to emerge from this study.

The breakdown yields four groups, the first being the "Big Three", those

### Profile of European product 1980



(the dark blue section consistently emerges with all products; the dotted light blue section only with some.)

countries that dominate the competition in world markets: Germany as a Community country, the United States and Japan (whose experts consistently compare its performance with those of Germany and the USA). Then comes a group of countries that are industrially quite well placed (France, Italy, the Netherlands, Belgium and Luxembourg — linked by their economic union, the BLEU — and the United Kingdom). These are followed by the main group of newly industrialised countries — Singapore, Argentina, Hong Kong and Mexico (with Brazil hard on its heels) — and, bringing up the rear, a miscellany: Denmark, Pakistan, India, South Korea, Ireland, Greece, Malaysia and Thailand. It should here be repeated that this ranking relates only to those products that were analysed and that the "residue" remaining after the "explanation" furnished by the model serves to explain the positions occupied on the list by certain countries. An econometric model can in fact never offer 100% explanations, whereas it is only the "explained" part of a phenomenon that can be used for derivations like those in Table 2. Secondly, if one takes those groups of products for which the EEC countries are not competing in the market with the newly industrialised countries, but are holding their own with the United States and Japan\*, then their profiles show that all have a low or medium elasticity of scale of production and a low energy input, a high skilled labour requirement, a high to medium R & D content and a generally low capital input.

\* Brief particulars of the structure are provided in the technical annex to this article, which can be obtained on request from the EIB Documentation and Library Division.

**Table 2:  
Ranking of the countries  
analysed**

Country	Value calculated for each country profile*
West Germany	3.55
United States	3.53
Japan	3.50
France	1.53
Italy	1.47
Netherlands	1.40
Belgium + Luxembourg	1.19
United Kingdom	1.19
Singapore	1.05
Argentina	1.03
Hong-Kong	1.02
Mexico	1.00
Brazil	0.95
Denmark	0.93
Pakistan	0.91
India	0.90
South Korea	0.67
Ireland	0.66
Greece	0.57
Malaysia	0.51
Thailand	0.39

\* The numerical scale that here emerges is one of the products of the model used, and as far as interpretation is concerned, the size of the figures is the only consideration of interest.

Such would appear to be the profile for activities offering promise in the various Member Countries of the EEC, based on an analysis of the situation in 1980 and using the mathematical model already described. That profile does in fact seem to accord with the general pattern of the **EEC countries' profiles**: moderate investment incen-

\* In order to single out those products with which Europe stands a real chance of success at the present time.

tives, more than adequate R & D, a none-too-abundant supply of energy, a relatively well trained workforce and isolated national markets. The typical profile for such a leading edge activity in the EEC countries in 1980, illustrated in terms of extreme contrasts, would thus be as shown in the diagram on page 9.

Such a "battle product" we might dub "long-nosed", after this physical profile (in contrast with the "wide-brimmed", "big-footed" profile that emerges for the products typical of the past upswing, during the post-war period, with their high intensiveness of capital and scale), although this is just a terminological ploy for expressing know-how or product values having a high service content.

To put it another way, these products do not arrive "free on board": there is a service content, of greater or lesser proportions, running from operating instructions through to maintenance and operator training throughout their useful life. In domestic appliances and motor vehicles, these do not amount to very much, whereas with computers software represents a service of considerable value. The econometric analysis carried out seems to indicate that the EEC Member Countries could make real progress in the field of advanced services and carve out a commanding position (i.e. a comparative advantage) by virtue of a policy designed to produce an economic upswing.

Instructive also is the position occupied by Germany (see Table 2): it ranks first for industrial production, for the size of its home market, for its trading conditions and for research and development; second for energy (after the United Kingdom); third for unearned income (after Greece and Italy), and fourth for the calibre of its workforce (after the United Kingdom and the Benelux, although this depends on the yard-

stick used). Moreover, its industrial production and its home market are not much smaller than those of Japan (about 95% and 80% respectively). All of which seems to point to the existence of a threshold value for sustaining production levels and market potential, a value that Germany has apparently reached. That same fact could also explain why Japan, with a domestic market 25% greater than that of Germany, is putting every effort into scaling up its potentialities through its aggressive export policies. Germany's brilliant export performance would seem to bear out this interpretation.

By way of probing further the impact of the sum total of factors referred to above, a further simulation using the model described was run, but this time with the following variables for the EEC countries modified as follows:

a) allowance was made for progress in the economic integration of Europe by weighting production, markets and research and development at the European level, so as to have these variables express the Community's integration of input and output markets and denote access to the results of European-level research and development;

b) the "business environment risk index" — expressing the likelihood of a project achieving success — was set at the optimum: 100 for all EEC countries.

For the immediate future, this is of course a far from realistic assumption, but it does not affect the overall outcome, as will presently become clear.

Making these adjustments produced a marked improvement in the ranking of the EEC countries, as the Table 3 shows.

Bearing in mind also that the United States and Japan were placed second (3.53) and third (3.50), the following points should perhaps be made:

a) 75% of the additional impact is attributable to the opening-up of new markets (probably an underestimate), 20% to access to European research and development, and only 5% to improved marketing prospects, including integrated policy measures, to the extent that it was possible to include these in the index used in the model;

b) the overall impact is probably an under-estimate, as it does not reflect

**Table 3: Improved performance ratings**

Ranking under Table 2		New ranking	
1.	West Germany	3.55	1.
4.	France	1.53	4.
5.	Italy	1.47	5.
6.	Netherlands	1.40	6.
7.	Belgium/Luxembourg	1.19	7.
8.	United Kingdom	1.19	8.
14.	Denmark	0.93	9.
18.	Ireland	0.66	10.
19.	Greece	0.57	15.

the workings of other variables, such as improvements in marketing strategy designed to exploit the opportunities presented by the three abovementioned factors;

c) a further result is that new product profiles, especially those calling for the broadening of scale, will also become accessible to the EEC countries' production potential: this can be proved by the simulation described below.

There is obviously still a considerable gap between the "Big Three" and the nine EEC Member Countries other than Germany, and it must now be equally clear that better integration of the economies of Europe could give a further boost to growth. A further simulation was in fact run, this time for the EEC as a whole, setting both industrial production and final markets at the European level, pitching labour skills and business environment at the highest level in Europe, profitability at the Japanese level, R & D at the U.S. level and energy supply at the level for Europe as a whole. The outcome was as might be expected: for the products under consideration, the EEC comes out with a rating of 5.0, as compared with 3.5 for the United States and Japan, with by far the largest share of the increase traceable to integrated product and market access, though in comparison with Japan, the increase in energy supply also impinges. Once again, it is abundantly clear that closer European integration offers new lines of production a better fighting chance.

This brings us to the final section of the study: pinpointing those activities that stand a real chance of achieving growth for the countries of the EEC.

#### **Alternatives for Europe**

To establish the **field of choice** before Europe, a number of viewpoints can be taken, with the aim of conducting a later selection.

To return, firstly, to Table 1: the selection could be made from Phase I ("upstream" activities), Phase II ("intermediate" activities) or Phase III ("downstream" activities). This in turn requires knowledge of the respective merits of addressing oneself to any particular one of these points of departure.

The thing to be gained from stimulating downstream activities is

the creation of a market for intermediate and upstream activities, but this is not to guarantee that the stimulus will operate in Europe, apart from which the regional impact will probably be greater in those areas where potential access is greater and where technical innovation finds more fertile ground.

Stimulation of intermediate activities could indirectly trigger upstream activities — with the same reservations as before — but would not necessarily create final markets; the same argument applies, a fortiori, to upstream activities as such.

All this seems to point at starting with downstream activities — an approach consistent with certain aspects of what Japan practises — especially if those activities are of European scale, to the extent that their effects work through to intermediate and upstream activities throughout the ten EEC Member Countries, and thus in turn tend to stimulate increased demand there from the technology and trade viewpoint. Furthermore, it will be necessary to isolate and analyse each and every obstacle, whether financial, human, commercial or perhaps technological. If this idea is squared with that of the typical European "leading edge" activity profile, we might well be left with the following chains:

- a) air transport and space projects requiring European-type construction facilities;
- b) new rapid rail links (inter-city, inter-regional and international);
- c) integrated energy systems and their applications (urban, regional, international);
- d) telecommunications and database services;
- e) civil engineering projects (coastal, environmental and urban);
- f) health projects.

One major area for expansion here comes to the fore: the downstream activities here in all cases are service functions — once, that is, the investments have been carried through — for which reason they are fully consistent with the 1980 "European profile" for highly labour-intensive activities using a skilled workforce. A programme — again vertically integrated through the upstream and in-

termediate phases also — could be developed to launch service activities to be pursued in non-Community countries. It is recommended that thought be given to the scope for getting such projects off the ground and formulating operational plans for that purpose. The developing countries in particular need infrastructure of the kind referred to above, while it is a known fact that the OPEC countries too are generally interested in this kind of project.

For the two groups of activities described above, the study cites various concrete activities not reproduced in this summing-up.

There is also a third line of thought concerning what happens when advanced processes are introduced into Europe's conventional sectors of activity, i.e. process innovation, as opposed to product innovation. The point at issue is a familiar one, that the direct effect on employment of the introduction of these activities is generally considered negative. The real question however is whether that is the actual case, when everything is taken into account, including indirect and multiplier effects. Take the **competitiveness** of European activity (in industry, agriculture and services) on both home and foreign markets, and the known fact that that quality is related to the introduction of such technology (robotics and FAS). Thus seen, the deployment of new methods may not only guarantee employment levels, but may also serve to raise them, especially if the European market as a whole is taken into account. The simulations to which reference has already been made well illustrate this important consideration. In this respect, the findings tally with those drawn from the model discussed previously: the line of argument referred to above stemmed from another model in which there were brought together both the direct and the multiplier effects of the production processes in question.

Fourthly, there is the whole field of **upstream products** (components and parts) already alluded to as parts of an integrated strategy — indeed, any "intermediate" activity is vitally dependent on the availability of advanced building units, such as:

— electronic components: micro-processors, sensors, bubble memories, superconductors and biochips;

— chemical and biochemical material: new fibres, composite plastics, new ceramics, "synterials", new alloys, metallic glasses, enzymes and recombinant DNA.

As far as the latter group is concerned, it should be pointed out that chemical and biochemical products did not appear in the list of Community-profile products, although the chemicals industry is currently in transition, going over from heavy chemicals to fine or special chemicals and biological "engineering". For these products — most of them integrated into the structures already referred to — which accord with the 1980 "European profile"; there is certainly scope for production in EEC countries. They form a voluminous series, only some elements of which appear above.

Finally, thought was given to the regional impact of future activities, especially as they will affect regions whose development is lagging, along the lines explored in the chapter on the development of backward regions in "Investing in Europe's future", the book published by the EIB to mark its twenty-fifth anniversary. For regions where access and receptivity to innovatory activity is limited, the logical thing to recommend is action at the base, i.e. upstream. This could be in support of innovatory and technological centres (leading to the creation and deployment of new technology), science parks, local concentrations of innovatory companies (like the ZIRST near Grenoble), activities tending to facilitate technology transfer from one firm to another, the dissemination of information and access to networks. Japan for instance does not confine itself entirely to downstream activities, but is at present exploring the concept of a "technopolis", which would be a kind of advanced form of the technological "growth centre" idea.

The list that now emerges begins to look quite impressive in its scope, but this then raises the question of the batting order: how great or how small is the chance of success in each case, and how should the priorities therefore be ranked? It was to this question that a final study was addressed, of the "multi-criteria" variety: the rest of this article takes up its main points.

### Ranking Europe's chances

In the light of the analytical studies described above, an evaluation was

made of the chances that "emergent" activities have of achieving breakthrough, applying the following criteria:

- a) the requisite scale of production and of the market;
- b) requirements in the areas, taken separately, of research and development, professional qualifications and energy;
- c) current market positions;
- d) contributions to Europe's external and technological positions;
- e) effects on employment and on balanced regional development, taken separately.

If the "employment" criterion is excluded, a priori, and the above criteria are assessed in decreasing order of importance, the following result emerges: the best-placed activity is electronic equipment, followed by energy structures; medical equipment and optical transmission systems then occupy the middle ground, while export projects, automatic guidance systems and science parks or high-tech estates come in an average-to-weak position. At the bottom of the classification come downstream projects, followed by components and "mechatronics".

The exercise was then repeated, with the employment criterion worked in, and drawing a distinction between production and introduction of "mechatronics", assuming also that Europe's production facilities are also functioning at a genuinely European level, i.e. for a European market. The most spectacular result of this operation, compared with the previous findings, stemmed from the introduction of mechatronics, a procedure that is extremely attractive, by virtue of the relatively high scores it achieves in relation to the major criteria. Also, compared with the previous results, optical transmission systems and medical equipment move up the optimal project ranking list. Energy structures, on the other hand, remain very much in contention, while electronic equipment, perhaps the first choice when related to integrated local European markets, joins the ranks of those projects that perform less well throughout this exercise: the downstream group, the components programme and production of mechatronic products.

The study demonstrates once again how fundamental the achievement

of a true European market is to securing Europe's participation in those changes that our countries must join their world partners in making to bring us all to the threshold of the twenty-first century. What remains now is to suggest ways in which the findings of the study might be acted upon, and this would appear to be a question of organised action at European level, with the provision of machinery for:

— the permanent, long-term pooling of ideas (promising groups of products, application of research and development to a broad band of products, rapid response to newly-emerging or embryonic markets);

— analysing the technical and economic minutiae of the findings described above and, to that end, establishing a data bank to make permanent monitoring possible;

— investigating the practical feasibility of integrated projects; technical and financial scope and marketing possibilities.

America and Japan, with their market economies, are already equipped with institutions responsible for assuming these various tasks, but Europe will have to respond to the challenge by taking a fresh initiative.

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