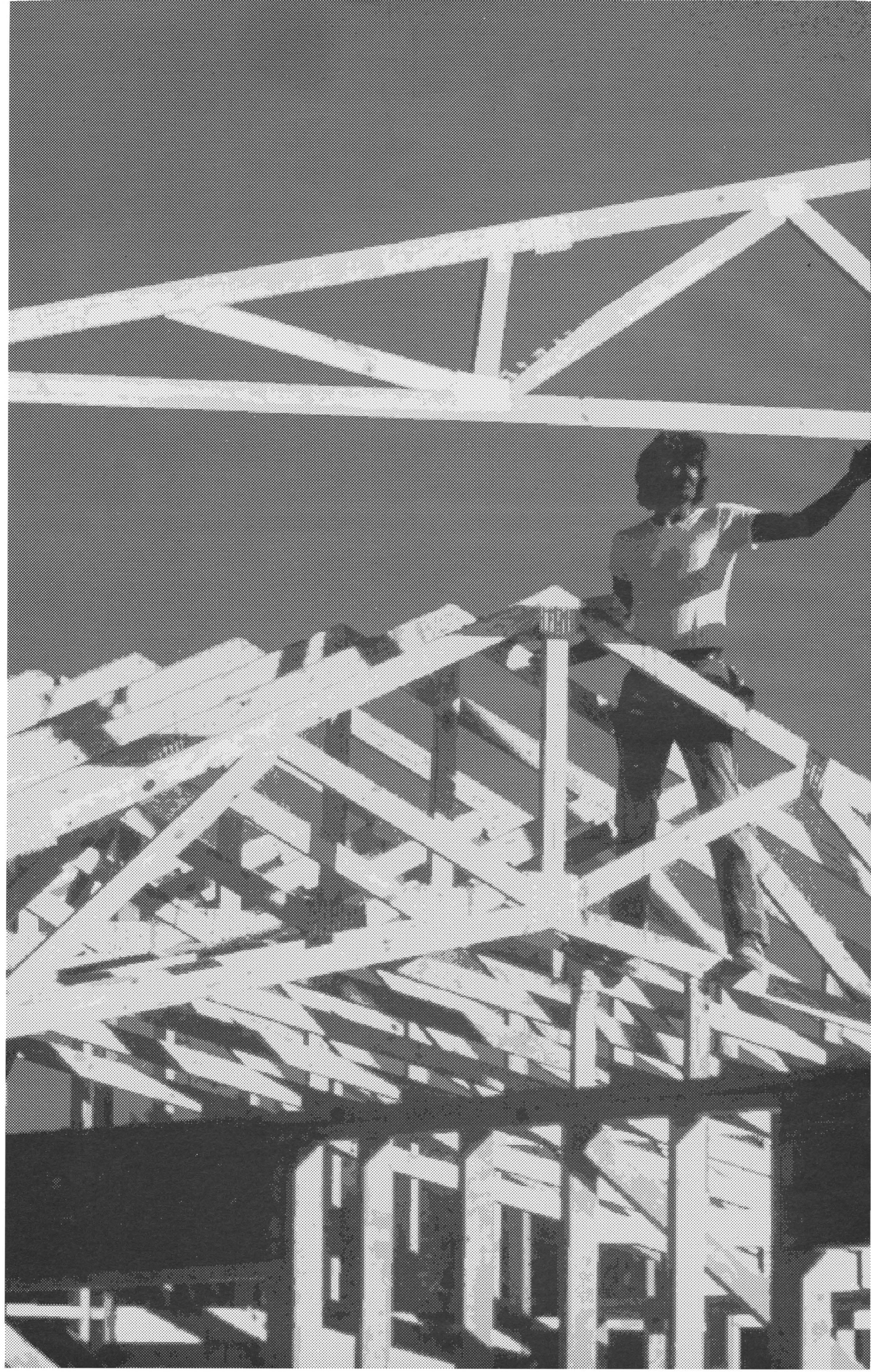


# Building and construction



By virtue of its size and particular characteristics, the construction industry occupies a vital place within European economies. Its importance is firstly due to the fact that the sector attracts a little more than fifty percent of overall investment (53.6% in 1987 for the whole of the Community as against 56.2% in the United States and 56.9% in Japan).

This sector is also a magnet for all domestic housing investment, 80% of government (State and local authorities) investment and 35% of gross fixed corporate asset formation.

As a manpower industry, the construction sector provided 10 million direct jobs in 1988 within the E.C. and E.F.T.A. countries i.e. equating to 6.6% of the working population.

Its added value, in relation to G.D.P., is on average 6.5%. The fact that building is becoming more industrialised and increasingly embraced by the service sector explains why the greater part of total production (60% on average) is now being absorbed by intermediaries. This being the case, it is clear that activities within the construction sector have a strong knock-on effect on other areas of the economy. It is estimated that for every 100 ECU spent on construction, a further 50 to 100 ECU are spent in other areas.

### Structure of the industry

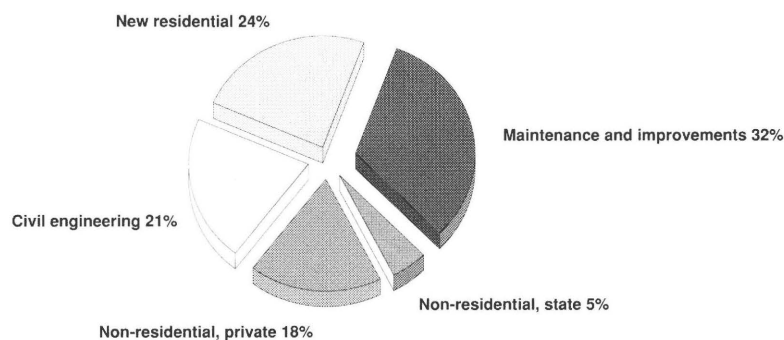
Considerable differences may be observed between the various Member States. In France and the United Kingdom, there are, on the one hand, small businesses and, on the other, extremely large groups with turnovers in excess of 2 billion ECU,

and no real middle category.

This two-way split is much less marked elsewhere. In the Federal Republic of Germany, medium-sized companies are strong and well established locally. In Italy, small and medium-



**Figure 1**  
**Construction**  
**Breakdown of activities in the construction sector, 1989**



Source: FIEC

sized businesses dominate the market. For the Community countries overall, it was estimated that the total number of businesses in this sector in 1989 amounted to 1,100,000. However, the fabric of production is extremely mixed:

- 91% of firms employ 0 to 10 employees. It is essentially a matter of local businesses carrying out the main part of their work in housing and the maintenance/improvement of the present housing stock;

- 8.5% of businesses employ 11 to 100 employees. They generally operate within a range of 100 km at the most;
- Finally, just 0.5% of construction firms have more than 100 employees.

The top twenty-five firms in 1989 are as shown in table 1. This league table is constantly evolving due to mergers and shareholdings implemented within the sector.

### Structure of the Market

The overall Building and Public Works

**Table 1**  
**Construction**  
**League table of the major firms in the sector, 1989**

| Company                      | Country | Turnover, (million ECU) | N° of employees (in thousands) | Share of export turnover (%) |
|------------------------------|---------|-------------------------|--------------------------------|------------------------------|
| Bouygues                     | F       | 6 696                   | 69.6                           | 28.4                         |
| BICC                         | UK      | 5 644                   | 46.0                           | 49.0                         |
| Tarmac                       | UK      | 5 250                   | 32.1                           | 17.0                         |
| SGE (Générale des Eaux)      | F       | 5 010                   | 63.2                           | 37.0                         |
| Trafalgar House              | UK      | 4 801                   | 29.1                           | 45.0                         |
| Skanska                      | S       | 3 851                   | 29.5                           | 20.0                         |
| Philipp Holzmann             | D       | 3 813                   | 28.7                           | 49.3                         |
| Dumez                        | F       | 3 734                   | 35.9                           | 72.7                         |
| SAE                          | F       | 3 691                   | 25.7                           | 40.8                         |
| Spie Batignolles (Schneider) | F       | 3 313                   | 38.8                           | 34.1                         |
| Italstat                     | I       | 3 129                   | N/A                            | N/A                          |
| George Wimpey                | UK      | 3 074                   | 17.4                           | 26.0                         |
| Amec                         | UK      | 2 966                   | 30.1                           | 18.0                         |
| Beazer                       | UK      | 2 932                   | 20.5                           | 51.0                         |
| GTM Entrepouse               | F       | 2 675                   | 30.7                           | 22.4                         |
| Hochtief                     | D       | 2 646                   | 26.2                           | 35.8                         |
| NCC                          | S       | 2 606                   | 19.3                           | 17.0                         |
| Costain Group                | UK      | 2 090                   | 13.8                           | 32.0                         |
| John Laing                   | UK      | 2 029                   | 12.8                           | N/A                          |
| Taylor Woodrow               | UK      | 1 967                   | 9.2                            | 25.0                         |
| John Mowlem                  | UK      | 1 943                   | 18.1                           | 17.0                         |
| Cegelec (CGE)                | F       | 1 940                   | 26.8                           | 39.9                         |
| HBG                          | NL      | 1 695                   | 13.2                           | 53.8                         |
| Bilfinger + Berger           | D       | 1 667                   | 30.2                           | 45.6                         |
| Diagados Y Construciones     | E       | 1 588                   | 13.9                           | 13.0                         |

Source: BIPE

(B.P.W.) market in 1989 was estimated at 420 billion ECU, exclusive of tax, for the Community as a whole and at 90 billion ECU, exclusive of tax, for the E.F.T.A. countries. This appraisal only takes account of work carried out by the trade, and excludes any individual work carried out by households or small contractors, construction-related services or any moonlighting activities. In relation to Community G.D.P. (4,375 billion ECU in 1989), the direct economic impact of the construction industry is in the region of 11%. This ratio is comparable to that of the United States, but in Japan it is around 18%. Nearly a quarter of all activities relate to the new housing sector. In 1989, 1650000 new residential units were built within the Community, which represents a construction ratio of about 5 units per 1000 inhabitants. For the E.F.T.A. countries, the 230 000 sites started correspond to a steadier rate of around 7%.

By way of a comparison, house-building stands at about 1 450 000 in the United States with a population of 246 million inhabitants, but at 1 650 000 in Japan (in 1988) for a population of 123 million inhabitants. On the whole, a relative balance may be observed between private and public housing. The former is distinctly dominant in Federal Republic of Germany, the United Kingdom and the Scandinavian countries, 65% on average, whilst the latter is predominant in Spain, Italy, Switzerland and Greece (also 65%).

The non-residential property market is just as large. The core of this activity depends on private demand for industrial buildings, office space, shops, hotels... There is a growing downturn in public sector demand

for school and hospital buildings as well as local government offices.

Maintenance and improvements to buildings account for a third of the total market and more than 40% of the turnover of construction firms. This activity corresponds directly to the size of the existing building stock. There are for example about 135 million residential units in the countries of the Community and nearly 14 million in the E.F.T.A. countries.

The flow of new construction therefore represents only a little more than 1% of existing stock.

Finally, civil engineering accounts for a fifth of overall activity. Specialist firms in this field are in charge of the construction and maintenance of the transport infrastructure (roads, motorways, airports, railways, waterways, ports,) networks and systems (water, drainage, sewerage telecommunications), energy-related activities (pipelines and works, electricity supply, power-station engineering).

This fragmentation of demand is not to be found at the supply level. Although skilled tradesmen and small contractors are principally involved in the construction of individual houses, coupled with maintenance/improvement activities, it is the large concern within the sector which cover the whole range of activities and very often carry out for themselves the necessary design and engineering studies.

Finally, the construction industry is very much in evidence in the international markets. It is often difficult to differentiate the relative shares of actual building-civil engineering exports, and independent design and engineering activities.

Similarly the distinction between the turnover of a parent company and that of its

local subsidiaries is still a very fine one.

Nonetheless European firms are still the world's leading exporters, outstripping the United States. In 1988 they secured 55% of all contracts implemented within the international market.

### **Current situation**

The second half of the 1980s was characterised by a real surge in the construction markets, with building and public works activities gaining ground more quickly than the economy as a whole (+4% as against +3.1%). Above all, this clearly illustrates the accelerator principle: once the conditions for restabilising the economy (more secure international environment, inflation under control, encouraging prospects) were restored, productive investment revived as sharply as it had dropped over the previous ten years.

There has been an even sharper change in the pace of investment in building and public works; after a period marked by an emphasis on investments in rationalisation, capital expenses suddenly surged up as the shortage of production capacity, the ageing of current stock, the requirements of new technologies, and the necessary loosening of the service sector became apparent. All this was accompanied by an enormous relocation of activity towards those sites offering the greatest potential for external economies.

At the same time, local authorities, profiting from the growth in the economy, reorganised their finances, which allowed them to relaunch their expenditure programmes as opposed to being reduced to giving priority to essential running costs, as had previously been the case. In spite of relatively high interest rates, households partly redirected their savings towards property,

due to improvements in their disposable income and a more stimulating psychological environment in the market.

For the Community as a whole, the volume of civil building engineering production increased by 22% between 1985 and 1990, after falling by 10% between 1980 and 1985.

The revival of the European construction market during the period 1985-1990 was based on the buoyancy of the civil engineering and commercial property markets. The 1992 Single Market encouraged the development of transport infrastructures, a necessary pre-requisite for the creation of a truly integrated European entity, hence, motorway, railway, airport and major link (Channel Tunnel, Great Belt) projects. At the same time, the European regions and major cities strengthened their road networks and public transport systems in order to make themselves economically more attractive. Finally, the growing importance of environmental concerns has become evident; drainage, water supply, soil decontamination, improvement of river banks, coastal protection, creation of national parks, etc.

Between 1985 and 1990, private sector demand for non-residential buildings rose by more than 40%.

The recovery of the economy and, above all, of productive investment, illustrated the need for further capacity within the industrial and service sectors. There has been a sharp rise in the office space market, further emphasised by relocations from the centre to the outskirts of large conurbations.

The growth in industrial buildings has been more uniform in geographical terms. In this field, the option of renovating exist-

**Table 2**  
**Construction**  
**Completed housing (EC and EFTA) (1)**

(in thousands)

|                     |       |
|---------------------|-------|
| 1986                | 1 570 |
| 1987                | 1 560 |
| 1988                | 1 610 |
| 1989                | 1 680 |
| 1990 <sup>(2)</sup> | 1 720 |
| 1991 <sup>(3)</sup> | 1 695 |

(1) Excluding Greece and Portugal

(2) Estimated

(3) Forecast

Source: BIPE

ing buildings holds little appeal, given the requirements of new industries.

Generally, commercial buildings have benefited from this situation, although signs of saturation can be observed at the super/hyper market and shopping centre levels.

In contrast, non-residential building which falls within the scope of public works is still on the decline. A slight upturn is explained by a gradual slowing down in needs, and priority being given to maintaining the existing stock. There are, however, signs of a change in the construction of educational buildings, with several countries having to cope with severe shortages

of university premises. During this same period, there was only a slight overall increase in the supply of new residential units.

The situation is at present growing worse in the United Kingdom (fewer than 200 000 houses built), but there is a strong upswing in Germany (300 000 completions scheduled for 1991, as against 183 000 in 1988). It remains moderate in Italy and Denmark. The outlook in Spain is good, while a downturn is expected in France. Population, credit terms and tax provisions relating to property, vary from one Member State to another, underlying the differences in development.

As a counterbalance, the growth in residential improvement-maintenance work has been distinctly steadier (3% annual average between 1986 and 1990).

### Outlook

The recovery in activity between 1985 and 1990 was reflected across the board by an increase in employment. Everything, however, seems to indicate that the improvement in the job market is dependent

on an increase in supply volume of at least 2% a year, due to increased productivity. An assumed increase of 2.5% a year between now and 1995 for the civil building engineering industry in Europe would therefore merely serve to boost the existing workforce capacity.

Over and above the quantitative aspect, we should not overlook the shortage of qualified workers in most Member States, particularly in the field of maintenance and renovation.

The construction industry is a great consumer of credit, whether for housing or for large expenditure programmes. This being the case, continued high interest rates pose an obvious threat to the financing of new operations.

The slight growth in the population in Europe will probably have certain repercussions in respect of housing, except in Germany which has to cope with a shortage of accommodation made worse by unification.

Quantitative needs could be reduced by a slowdown in the creation of new house-

**Table 3**  
**Construction**  
**Variations in volume of output as a % compared with the previous year within the EC (1)**

| Sector                                       | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 <sup>(2)</sup> | 1991 <sup>(3)</sup> | 1994/<br>89 <sup>(4)</sup> |
|--|------|------|------|------|------|------|------|------|------|---------------------|---------------------|----------------------------|
| Building:                                    | -5.1 | -3.5 | 0.2  | -1.5 | -1.7 | 2.7  | 4.0  | 5.1  | 4.4  | 1.9                 | 0.4                 | 1.4                        |
| Housing                                      | -5.2 | -3.1 | 1.6  | -2.0 | -4.2 | 1.2  | 2.1  | 4.0  | 1.6  | 1.3                 | 0.9                 | 1.2                        |
| New  | -7.3 | -4.8 | 3.5  | -4.2 | -9.8 | -1.7 | 0.7  | 4.5  | -0.3 | -1.1                | -0.2                | 0.5                        |
| Modernisation and maintenance <sup>(5)</sup> | -0.2 | 0.3  | 1.0  | 2.4  | 3.6  | 5.1  | 4.7  | 3.3  | 2.3  | 2.9                 | 1.8                 | 2.0                        |
| Non-residential <sup>(6)</sup>               | -5.0 | -4.1 | -2.3 | -0.6 | 2.2  | 4.8  | 6.2  | 6.6  | 8.8  | 3.3                 | 0.0                 | 1.9                        |
| Privat <sup>(7)</sup>                        | -5.0 | -4.8 | -1.7 | 0.4  | 3.9  | 5.8  | 7.7  | 8.6  | 10.6 | 3.1                 | -0.3                | 2.1                        |
| State <sup>(8)</sup>                         | -3.7 | -3.1 | -2.8 | -2.5 | -2.2 | 1.9  | 1.9  | 1.3  | 4.1  | 4.2                 | 1.8                 | 1.2                        |
| Civil engineering                            | -1.1 | 2.0  | -2.1 | -4.0 | -1.3 | 4.2  | 2.1  | 8.5  | 8.8  | 6.8                 | 3.9                 | 3.5                        |
| Construction                                 | -4.4 | -2.5 | -0.5 | -1.9 | -1.4 | 3.2  | 3.7  | 5.8  | 5.2  | 2.7                 | 1.1                 | 1.9                        |

(1) Excluding Greece and Luxembourg

(2) Estimated

(3) Forecast

(4) Excluding Portugal

(5) New construction only

(6) Excluding Denmark

Source: FIEC

holds. To compensate for this, supply will have to adapt to new demand (the elderly, the young, single people).

On the other hand, the outlook seems favourable for non-residential construction and civil engineering. Demand for industrial buildings and office space will be maintained by the strength of productive investment, the demands of rationalisation, and everything surrounding the relocation of those activities.

As for civil engineering, the scale of transport infrastructure projects within Europe

and the development of environmental concerns offer this sector great opportunities.

In this sphere, the Community market is already a reality, as demonstrated by the routine joint ventures between large European groups involved in such major schemes.

This pooling of experience and skills should strengthen Europe's position as the leading world exporter of building and civil engineering works, ahead of the United States and Japan.

At the turn of the Twentieth Century, devel-

opment and town planning will certainly be a major challenge for those involved in European construction. Preserving old districts, recovering town centres, renovating suburbs, opening up deprived regions, improving the environment, developing transport, helping developing countries - such are the prospects for activity within the European construction industry during the years to come.

**Written by: BIPE**

All countries of the European Community reflect sharply rising inflationary tendencies which in the construction industry in particular involve considerably higher price rises than are indicated by statistically calculated inflation rates. In many construction areas these price rises have as yet caused no downturn in the order situation, as building promoters are apparently not discouraged by the prospect of further price increases. Future trends in construction costs together with the parallel rise in the costs of building finance, point to a deepening recession in building construction over the next few years, as the situation in some Members States is already showing.

### Description of the sector

The building construction industry is concerned with the construction of new dwellings as well as private and public non-residential buildings (offices, schools and others) and increasingly with the modernization and re-development of properties. Because of the sustained demand for buildings the construction industry occupies a key position in both the economic and the social development of all member countries of the European Community.

### Current situation

The fortunes of the building sector in the countries of the European Community follow the trend in the economic development of those countries without, however, being adequately or solely explained by it. While growth in building production in

Spain, Portugal and Ireland in 1990 was more pronounced than the overall expansion in economies, the building economy in the United Kingdom, Denmark and the Netherlands will prove to be weaker than general developments in the other sectors of industry in these countries.

This fact alone means that there will be no general saturation in the demand for new buildings. The economically and technically based structural changes in the EC member countries will rather tend to bring about a rising demand for new constructions, especially in those areas where the structural changes are most evident:

Spain, Portugal, Ireland and lately - owing to events in Central and Eastern Europe - Germany.

In addition there is an increasing require-

ment for replacement buildings and for the modernisation and upgrading of existing structures. This is primarily reflected in the relative decline of the core construction trade in favour of the secondary finishing trades.

Government economic policies affect building construction both directly - in the form of public construction projects funded from national budgets and subsidies for private building ventures - and indirectly - by tax relief and other monetary and financial government intervention.

In a number of EC countries government spending cuts have affected work in public sector building both directly and indirectly; this is particularly the case in Belgium and Italy. In these countries there have been indirect limitations imposed on the construction industry by restrictive monetary and fiscal policies. Private building enterprise has been particularly hard hit.

Direct public sector inducements for the construction of local government housing have been in sharp decline in recent years, but in certain member countries, especially the Federal Republic of Germany and France, this can change as a result of the rising demand for rented accommodation.

## Technology

In recent years technological progress has been achieved above all in building techniques, the use of building materials, the deployment of construction machinery and in the organisation of construction sites.

However this progress will only gradually work its way through to the small and medium sized building contractors, and no new impetus towards technological innovation and change is currently in prospect.

Two unusually mild winters (1988/89 and

1989/90) encouraged a marked upturn in building activity and some improvement in the cost situation in the northern regions of the European Community.

## Company structure

The building industry is more heterogeneous than most other sectors of the economy in terms of the size of building contractors, their production range and geographical distribution.

The size structure continues to be typified by a multitude of small contractors; 91% of building firms in Europe employ no more than ten people. The share in total building construction turnover of a country on the other hand better demonstrates the economic importance of the big building contractors with more than 500 employees: in Italy and Belgium it is 17%, in Germany it is 24%, in France 36% and in the United Kingdom as high as 42%.

It is hardly surprising therefore that of the 36 largest publicly quoted construction companies of the European Community, 15 operate out of the United Kingdom, 14 are based in France and four in Germany.

The site-based production pattern leads to a pronounced geographical spread of building contractors and hence of overall construction resources. The often dramatic recessionary tendencies in the construction industry in the years 1970-85 brought about a widespread collapse of contractors in most areas. Since the economic recovery of the years 1986-88, the resulting decline in capacity is now making itself felt with particular keenness in those regions where the need to catch up on building investments is greatest.

The upswing in construction activities in the various regions of the European Com-

munity does not always have a generally stabilising influence, since the available production capacities of the small and medium size companies in particular are difficult to transpose to the areas of greatest demand.

A comparison of costs and performance reveals wide fluctuations with regard to company size and geographical theatre of operations, and is heavily dependent on the achievement of improvements in productivity. Such objectives can be achieved with an intensified utilization of pre-site and off-site resources such as ready mixed concrete and prefabricated building sections, by increased mechanisation, the greater use of leased plant and machinery, the improved internal corporate organization of construction sites and cooperation with other contractors involved both upstream and downstream in the building process.

Given diminished production capacities, the pressure of competition has substantially normalised for the small and medium size contractors; for the large building firms however, competition has if anything tended to intensify. The decline in their traditional foreign contracting, especially in the OPEC and developing countries, has channelled the operations of these companies more than ever towards the domestic and European markets. The anticipated relaxation in competition as a result of the shifting of production capacities into Eastern European markets has had little beneficial effect to date.

## Production developments

The growth sustained throughout the entire EC building construction industry over a number of years slowed down in 1990 and will tail off to a growth rate in



**Table 1**  
Tendencies in building construction by Country (1)  
Changes in building volume at constant prices compared with previous years

| (%)             | 1981  | 1982  | 1983  | 1984  | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 <sup>(2)</sup> | 1991 <sup>(2)</sup> |
|-----------------|-------|-------|-------|-------|------|------|------|------|------|---------------------|---------------------|
| EC              | -5.1  | -3.5  | 0.2   | -1.5  | -1.7 | 2.7  | 4.0  | 5.1  | 4.4  | 1.9                 | 0.4                 |
| Belgique/België | -28.4 | -2.8  | -3.2  | -3.7  | 2.7  | 4.8  | 5.9  | 15.2 | 12.3 | 3.1                 | 2.0                 |
| Danmark         | -19.3 | -7.1  | 1.0   | 14.4  | 6.8  | 17.1 | 8.5  | -3.9 | -6.4 | -9.3                | -5.9                |
| BR Deutschland  | -4.2  | -4.0  | 2.6   | 0.2   | -8.5 | 1.6  | 0.3  | 4.3  | 4.5  | 5.8                 | 4.0                 |
| España          | -6.0  | -3.0  | -4.0  | -5.0  | 1.0  | 6.0  | 8.0  | 6.8  | 9.0  | 5.9                 | 1.0                 |
| France          | -0.6  | -3.9  | -4.1  | -3.8  | -1.2 | 0.7  | 2.5  | 4.6  | 3.5  | 2.6                 | 0.3                 |
| Ireland         | 5.8   | -13.8 | -10.9 | -11.9 | -5.3 | -4.8 | -3.8 | -6.0 | 10.7 | 10.6                | N/A                 |
| Italia          | -3.6  | -8.0  | 1.7   | -1.1  | 0.2  | 1.4  | -0.9 | 0.6  | 3.5  | 2.9                 | 1.5                 |
| Nederland       | -12.0 | -6.6  | -2.5  | 4.6   | 2.0  | 6.8  | 3.4  | 12.6 | 3.0  | 0.3                 | -1.8                |
| Portugal        | 10.6  | 9.7   | 2.1   | -20.9 | -6.0 | 5.7  | 21.8 | 11.0 | 2.2  | -0.3                | 5.4                 |
| United Kingdom  | -10.3 | 1.3   | 4.9   | -4.2  | 1.8  | 3.3  | 8.7  | 7.4  | 4.1  | -4.4                | -4.9                |

(1) Except Greece and Luxembourg  
(2) Estimated  
(3) Forecast  
Source: FIEC

real terms of 0.4% according to 1991 estimates. This prediction is however of little significance for analysis and decisions in the sector, as developments in the various European countries and the individual building construction segments have a very varied response to events. In building construction, international activity is the exception rather than the rule. This also applies to the individual construction branches classified in terms of clients corresponding to sub-markets of the construction industry, which are highly disparate as regards cause and effect one upon the other.

It follows that most small and medium sized contractors only operate in certain sections of the market and are therefore at the mercy of the specific regional development of their section. Only the large contractors are in a position to deploy their capacities according to the shifting emphasis in regional markets and their individual sectoral market areas. For these companies therefore the structural shifts in the sectoral market sections in individual EC countries are important.

### Structural developments

**Non-Residential** Non-residential construction has displayed the healthiest development within the building construction industry

in recent years and accounts for roughly one fourth of all building activity. This dynamic is achieved above all due to the healthy expansion of the service industries in national economies: the hotel and catering trade, homes and sanatoria, private leisure facilities, shops and offices. In 1989 non-residential building work in all countries of the European Community achieved the highest growth rates even in areas where building construction as a whole is on the decline; examples include the United Kingdom with + 16.7% and the Netherlands with + 8.7%. Only in Spain and Portugal were growth rates in public sector building even higher than in non-

**Table 2**  
Building construction  
Tendencies in non-residential building by country (1)  
Changes in building volume at constant prices compared with previous years

| (%)                 | EG   | B     | D    | E    | F    | IRL   | I     | NL    | P     | UK    |
|---------------------|------|-------|------|------|------|-------|-------|-------|-------|-------|
| 1981                | -5.0 | -20.0 | -2.8 | N/A  | 1.7  | 0.9   | -8.6  | -15.8 | 2.6   | -7.1  |
| 1982                | -4.8 | 8.4   | -1.3 | N/A  | -4.5 | -16.5 | -13.7 | -11.4 | 10.6  | 0.1   |
| 1983                | -1.7 | -1.4  | 2.6  | N/A  | -2.0 | -28.6 | -1.6  | -7.6  | -8.5  | -1.8  |
| 1984                | 0.4  | 1.9   | 0.0  | N/A  | -2.4 | -32.4 | -3.1  | 9.4   | -22.2 | 10.6  |
| 1985                | 3.9  | 8.1   | -3.6 | N/A  | -0.4 | -21.1 | 8.8   | 7.6   | -3.4  | 10.3  |
| 1986                | 5.8  | 12.4  | 6.0  | 5.0  | 3.2  | 1.0   | 7.0   | 13.1  | 8.5   | 5.0   |
| 1987                | 7.7  | 10.7  | 3.7  | 14.7 | 4.8  | 19.5  | 0.6   | 3.7   | 23.3  | 15.0  |
| 1988                | 8.6  | 15.1  | 5.1  | 11.7 | 7.8  | 1.7   | 4.7   | 18.0  | 11.0  | 11.2  |
| 1989                | 10.6 | 12.5  | 7.4  | 12.0 | 6.9  | 27.8  | 7.9   | 8.7   | 8.7   | 16.7  |
| 1990 <sup>(2)</sup> | 3.1  | 3.0   | 5.0  | 6.0  | 5.6  | 25.0  | 3.5   | 7.5   | 3.0   | -9    |
| 1991 <sup>(2)</sup> | -0.3 | 4.9   | 3.0  | 4.0  | 2.2  | N/A   | 2.0   | 1.8   | 5.7   | -10.1 |

(1) Except Greece, Denmark and Luxembourg  
(2) Estimated  
(3) Forecast  
Source: FIEC



**Table 3**  
**Building construction - Tendencies in residential building by country (1)**  
**Changes in building volume at constant prices compared with previous years**

| (%)             | 1981  | 1982  | 1983 | 1984  | 1985  | 1986 | 1987 | 1988 | 1989 | 1990(*) | 1991(*) |
|-----------------|-------|-------|------|-------|-------|------|------|------|------|---------|---------|
| EC              | -5.2  | -3.1  | 1.8  | -2.0  | -4.2  | 1.2  | 2.1  | 4.0  | 1.6  | 1.3     | 0.9     |
| Belgique/België | -43.5 | -4.7  | -1.9 | -2.4  | 5.3   | 2.2  | 4.8  | 24.9 | 19.1 | 3.0     | -0.6    |
| Danmark         | -19.7 | -3.8  | 5.4  | 15.4  | -1.8  | 19.9 | -6.7 | -9.0 | N/A  | N/A     | N/A     |
| BR Deutschland  | -5.5  | -5.1  | 4.6  | 0.8   | -11.6 | -1.2 | -1.5 | 4.3  | 4.0  | 7.0     | 5.0     |
| España          | -7.0  | -3.5  | -4.0 | -6.0  | 1.0   | 5.0  | 7.0  | 5.4  | 5.0  | 2.8     | -0.8    |
| France          | -2.1  | -3.5  | -5.1 | -4.5  | -2.2  | -0.9 | 1.0  | 3.5  | 2.3  | 1.2     | -1.1    |
| Ireland         | 8.0   | -18.6 | -0.6 | -0.1  | -3.2  | -6.5 | 10.9 | -6.5 | 13.9 | 7.6     | N/A     |
| Italia          | -0.1  | -4.2  | 4.1  | -0.6  | -3.5  | -1.6 | -2.5 | -1.3 | 1.0  | 2.5     | 1.2     |
| Nederland       | -8.9  | -5.2  | -0.2 | 4.8   | 0.7   | 5.2  | 2.0  | 12.5 | 0.4  | -3.7    | -5.8    |
| Portugal        | 14.4  | 9.0   | 3.6  | -18.1 | -6.6  | 2.4  | 19.7 | 10.0 | -2.0 | 3.5     | 5.6     |
| United Kingdom  | -13.5 | 1.9   | 11.0 | 0.8   | -1.2  | 5.6  | 8.1  | 6.7  | -5.9 | -8.5    | -1.6    |

(1) Except Greece and Luxembourg

(\*) Estimated

(\*) Forecast

Source: FIEC

residential construction; in Spain with + 28.0% as against + 12.0% in non-residential construction and in Portugal with + 15.0% compared to + 8.7%).

This picture is also reflected in the statistically calculated real growth rates for 1989 for the European Community as a whole, with + 4.1% for public sector building and + 10.6% for non-residential building.

Initial forecasts for 1991 point to lower growth rates in real terms for this section of the building industry. These growth rates have to be corrected to the level of 1990 however, since the planned asset investments by building contractors will in fact prove to have been more substantial than anticipated, and linked to a rise in industrial and commercial building activity.

#### Public-sector building construction

More than half of investments in public-sector building construction are the result of decisions by local government. This factor is paramount for the volume of public-sector construction, and is determined not so much by a requirement for buildings than by the financial situation of local and regional authorities.

Regionally packaged development pro-

grammes designed to improve the infrastructure are having a particularly marked effect not just in areas such as Spain and Portugal but also in the new federal regions in the east of Germany, albeit with some time lag.

Except for these areas, growth rates in public-sector building in the European Community are in decline or wholly negative.

**Residential building** The construction of apartment housing, one segment of the residential construction market, is governed by quite different forces than the other industrial products: this is an area where financing costs and their variations exert a far greater influence on building production than the changes in market volumes, production costs and the utilisation of capacities.

The market volumes are indeed growing, given that increasing real incomes make for more quality-conscious residents and that population shifts towards more flourishing economic areas increase the demand for housing in those areas. Nevertheless these positive effects are countered by a tendency in financing costs which continues to depress the profit expectations of this investment sector and to put these long-term investment assets at a disadvant-

age compared with other fixed assets.

It is hardly surprising therefore that new starts in the building of apartment housing are in decline; in 1990 for example, in the United Kingdom with - 13.7%, in the Netherlands - 12.0% and in Denmark with - 4.2%.

Developments that deviate from this overall trend to any significant level are to be found only in countries in which public housing subsidies or tax inducements offset the fundamental financial obstacles and the consequential effects on building activity, as for example in Ireland with +8.7%, Germany with + 6.4%, Spain with + 3.0% or Italy with + 2.2%.

The construction of single-family homes makes a very substantial contribution to the supply of housing for the populations of the European Community, but compared with the total volume of building construction it remains largely insignificant except for some of the smaller construction firms and self-employed building contractors.

**Building modernisation** The growth trend in the modernisation and redevelopment of residential buildings continues to remain strong in virtually every member

**Table 4**  
**Building construction - Residential refurbishment and maintenance (1)**  
**Changes in building volume at constant prices compared with previous years**

| (%)            | 1981  | 1982  | 1983 | 1984 | 1985 | 1986 | 1987  | 1988  | 1989(?) | 1990(?) |
|----------------|-------|-------|------|------|------|------|-------|-------|---------|---------|
| Danmark        | -1.3  | 7.3   | -4.5 | 5.1  | -0.8 | 11.9 | -12.7 | -7.9  | -2.0    | 0.0     |
| BR Deutschland | 6.2   | 2.0   | -3.4 | 2.3  | 5.2  | 9.6  | 7.8   | 4.8   | 2.4     | 5.6     |
| España         | N/A   | N/A   | N/A  | N/A  | N/D  | 6.0  | 12.0  | 6.0   | 5.5     | 5.0     |
| France         | 1.5   | 0.9   | -2.2 | 1.1  | 3.2  | 1.2  | 0.5   | 2.0   | 1.7     | 3.4     |
| Ireland        | -13.0 | -31.3 | 0.1  | -0.3 | 6.4  | 40.4 | 10.7  | -16.3 | 1.3     | 3.7     |
| Italia         | 0.0   | -1.7  | 7.7  | 1.6  | 0.0  | 4.3  | 1.5   | 0.0   | 1.0     | 2.0     |
| Nederland      | -3.2  | -2.2  | -5.3 | 7.1  | 16.7 | 2.2  | 4.1   | 7.2   | 1.4     | 2.1     |
| United Kingdom | -9.0  | 1.7   | 4.2  | 4.9  | 3.5  | 4.5  | 6.4   | 5.5   | 0.5     | -5.3    |

(1) Except Greece, Luxembourg, Belgium and Portugal

(2) Estimated

(3) Forecast

Source: FIEC

country of the European Community. This section of the building trade is growing in importance in relation to overall building construction.

Always the traditional preserve of mainly small building contractors, more and more medium sized and a few large construction firms are recognising a new field of activity whose market and productivity potential has yet to be fully tapped.

### Trade trends

Building activity by contractors outside the European Community is restricted to a few large joint-stock construction companies and to a share of total building volume of less than 5%. Operations by non-European contractors within the Community are virtually insignificant both regionally and in overall terms.

Future trends in traditional overseas building projects are marked by poor returns and increasing financial risks. The importance of traditional foreign construction will continue to decline unless the trend can be reversed by new construction projects in the countries of Eastern Europe in future, but no confident predictions of this are possible at the present time.

Up to 1983 the major joint-stock construction companies accounted for a good two-fifths of the total building volume in the

traditional overseas business, but statistics reveal that this position is in decline. In terms of corporate policy, however, this tendency does not reflect the true significance of overseas construction activity for these companies. Rather they have tended in recent years to exert their influence through foreign holdings and subsidiaries, thereby assimilating with local contractors.

### Employment trends

Like the building industry as a whole, the building construction sector is a highly labour intensive business with corresponding interaction with overall employment. Far-reaching technical changes and innovations such as the increased use of prefabricated sections and a growing need for improved commercial organization are leading to considerable changes in the staffing structures of these companies.

Office and white-collar jobs are taking on increasing importance compared with the actual numbers of construction workers on building sites, while on the building sites themselves the percentage of skilled workers in relation to semi-skilled and unskilled labourers is growing.

Compared with other comparable sections of the industry the ratio of senior skilled workers (over 50 years of age) in the build-

ing trade is very high, one particular reason for the urgent need to attract fresh blood and to constantly train construction workers. It follows from this that the losses of skilled labour through retirement will be particularly deeply felt over the next few years.

The varying levels of personnel costs in the building industry of the European Community and their breakdown in direct wages and personnel overheads assume less significance than the difficulties firms are experiencing in obtaining a plentiful supply of adequately qualified employees.

### Investment trends and associated developments

Investments by construction companies vary considerably from one country to another and depending on the size of the company. The growth in investment anticipated for 1990 is hardly likely to materialise in the European Community as a whole.

The demand for fresh investment is also continuing to weaken as a result of falling capacity in plant and other areas, the increasing efficiency and performance of construction machinery and the expansion in plant leasing which relieves the pressure on companies to make their own investments.

## Special issues

The building construction industry - irrespective of the size of a company - operates with a relatively high percentage of input from other contractors, one half from other building firms, and with finishing trades and transport companies. This is due in particular to the high proportion of main contractor services down to and including turnkey projects.

This feature has always been most marked in France and the United Kingdom but it is a tendency which is now making inroads into Spain, Italy and Germany as well.

## Outlook

The economic and technical structural changes in the countries of the European Community are leading to a growing demand for new buildings. This is particularly the case in those areas where the structural changes are most marked.

No new impulses from technological change are currently discernible, but the technological improvements already implemented by the larger construction companies are now making themselves felt in smaller building firms as well.

A number of medium sized and some larger contractors see the upgrading and refurbishment of existing buildings as offer-

ing new business opportunities whose market and productivity potential has not yet been exhausted.

A growing part of main contracting services over whole construction projects including turnkey completion can be identified as a tendency for the whole construction industry i.e. small, medium and large construction companies in all countries of the European Community.

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The civil engineering sector has been characterised since 1988 by average growth rates of around 8%, which make it the most dynamic building sector in the European Community. The public sector is the most important client for this industry.

In future a substantial proportion of investments will be devoted to both environmental protection and the technological rejuvenation of the infrastructure.

### Description of the sector

As part of the construction industry, civil engineering companies are involved in earthmoving and land improvement projects;

- bridge-building, tunnelling and shaft construction, land drilling;
- hydraulic engineering (especially river, canal, harbour, lock and dam construction);
- communications projects (roads, railways and airports);
- irrigation and drainage, effluent disposal and the installation of sewage treatment facilities;
- the development and operation of refuse disposal facilities, the clearance of abandoned polluted sites and the elimination of environmental damage,
- miscellaneous civil engineering works.

### Current situation

Unlike building construction, civil engineering only partly - and as a rule anticyclically - follows the general trends in

economic development. To this must be added the fact that many projects only come to fruition after lengthy processes of planning, decision-making and putting out to tender, and that project implementation and financial accounting is often spread out over a number of years. This is a direct result of the large degree of dependence of the civil engineering industry on its mainly public-sector clients.

In highway construction in particular, as well as in water-resource projects, it is above all local and regional authorities who give the go-ahead for projects. Their decisions are largely determined by their own economic and financial position and not by any actual requirement for investment in the first instance.

Civil engineering activities are also greatly affected by the specific financial status of individual public-sector corporations and in particular the national railway companies. Large deficits in railway company budgets lead to heavy cutbacks and delays in civil

**Table 1**  
Tendencies in civil Engineering by Country  
Changes in construction volume at constant prices compared with previous years

| (%)               | 1981 | 1982  | 1983  | 1984  | 1985  | 1986 | 1987  | 1988 | 1989 | 1990 <sup>(*)</sup> | 1991 <sup>(*)</sup> |
|-------------------|------|-------|-------|-------|-------|------|-------|------|------|---------------------|---------------------|
| EC <sup>(1)</sup> | -1.1 | 2.0   | -2.1  | -4.0  | -1.3  | 4.2  | 2.1   | 8.5  | 8.8  | 6.8                 | 3.9                 |
| Belgique/België   | -1.4 | -12.2 | -15.0 | -13.4 | -11.9 | -3.1 | -7.7  | 3.0  | -9.7 | 3.5                 | 0.0                 |
| Danmark           | -4.1 | 24.3  | -0.2  | -6.3  | 6.7   | 20.6 | -4.6  | 1.8  | 1.8  | 1.2                 | 3.3                 |
| BR Deutschland    | -6.3 | -3.1  | -5.2  | 2.8   | 0.7   | 6.2  | -1.0  | -4.0 | 5.2  | 4.6                 | 2.0                 |
| España            | 11.9 | 14.0  | 8.0   | -7.0  | -2.0  | 3.0  | 4.0   | 20.0 | 25.0 | 20.0                | 12.0                |
| France            | -2.9 | -7.0  | -6.4  | -8.6  | 4.4   | 6.3  | 7.4   | 9.8  | 6.0  | 0.0                 | -2.0                |
| Ireland           | 7.4  | 10.7  | -16.8 | 1.6   | -8.5  | -1.9 | -15.3 | -2.3 | 4.4  | 5.1                 | N/A                 |
| Italia            | 5.5  | 6.3   | -0.1  | -0.3  | -3.5  | -0.5 | -2.1  | 4.6  | 4.1  | 3.0                 | 2.0                 |
| Nederland         | -3.6 | -6.4  | -1.9  | 2.4   | 2.5   | 2.7  | -5.0  | 1.5  | 0.1  | 4.0                 | 4.3                 |
| Portugal          | -2.5 | 13.0  | -11.8 | -15.9 | -6.6  | 4.7  | 15.6  | 15.0 | 12.0 | 8.0                 | 10.0                |
| United Kingdom    | -5.5 | 1.6   | 2.6   | -2.5  | -3.7  | 2.7  | 1.8   | 5.8  | 5.6  | 4.4                 | 4.5                 |

(1) Except Greece and Luxembourg  
(\*) Estimated  
(\*) Forecast  
Source: FIEC

engineering projects.

### Corporate structure

The structure of companies involved in civil engineering are comparable with those in building construction. Some four-fifths of all companies in this sectors employ fewer than 50 people, but around half of employees in the entire sector work for companies with personnel complements of more than 500.

The generally positive development in building production in this sector is also reflected by an increase in the creation of new specialist civil engineering firms and by a return of companies to the civil engineering markets, in particular those in the fields of transportation, building construction and building materials.

### Production developments

The civil engineering sector has been characterised since 1988 by average growth rates of around 8% which make it the most dynamic building sector in the European Community.

This tendency is explained partly by a backlog demand as a result of the extensive neglect of public-sector infrastructure investments at the beginning of the Eighties, and partly by increased efforts aimed

at improving environmental protection as a result of rapidly growing public and private sector investments in these areas.

Such infrastructural investments provide the civil engineering industry with growth rates which are most pronounced in Spain (annual real growth of 20%) and in Portugal (annual real growth rates around 15%). Declining and stagnating tendencies are discernible only in Denmark, the United Kingdom, Luxembourg and Belgium, not however due to any lower level of demand, rather because of the restrictive budgetary and financial situation in these countries.

The clear expansion in commercial and industrial building in the building construction sector is also benefiting civil engineering, since one quarter of all investments in commercial and industrial projects are devoted to civil engineering services: supply lines, effluent treatment plants for factories, pipelines and drainage systems. The growing call for emission control and protection measures by industrial facilities will enhance these promotional factors in the coming years.

### Structural tendencies

**Expansion in communications** The lion's share of construction projects in this sector is still concerned with the upgrading and expansion of existing road and railway links of national significance. Substantial efforts at new construction work are being made, particularly in those countries with comprehensive transport development programmes; this is the case for example in France with new motorway and urban detours as well as the continued expansion of the high-speed rail network with international importance; in the Netherlands there is a comprehensive schedule of highway and railway expansion; and in Spain, where infrastructure investments for the Olympic Games and the World's Fair constitute major focal points for new investment.

**Bridge-building, tunnelling, shaft construction** The expansion of communications naturally includes major bridge-building and tunnelling projects, and the ongoing construction of the Channel Tunnel is a prime example of this, overshadowing as it does the planning of all other large-scale bridge and tunnel building projects. Nevertheless a number of tunnel projects in the Netherlands

and tunnel and bridge building projects for supra-regional communications facilities in Denmark and Italy should be mentioned.

**Hydraulic engineering** This branch of civil engineering is currently on a "back burner" in the countries of the European Community, a trend that is particularly noticeable in the Netherlands following the almost total completion of major hydraulic projects such as the Zuiderzee works and the damming in of the Oosterschelde, since the proposed flood prevention measures for many waterways are hardly likely to afford any matching utilisation of capacity.

The only regions to display positive tendencies are France with its comprehensive redevelopment programme for seaports, and Spain and Portugal with their investments in supra-regional water distribution by means of new canal systems.

**Effluent disposal** There is a general sharp increase in effluent treatment and disposal by local and regional authorities in the European Community; the focal areas here are Germany, the Netherlands and Spain. In future we can expect to see a similar trend emerging in the United Kingdom as well, now that the British water authorities have been privatised.

**Modernisation and refurbishment** As in the building construction industry, the upgrading of public and private sector infrastructure facilities is assuming a steadily expanding proportion of business, with rising growth rates. In the forefront of business opportunities here are bridge development projects and improvements to communications.

**Earthmoving** Earthmoving in the true sense of the term, and in so far as it does not come under other civil engineering branches such as highway construction, is presently limited to public-sector investment projects in the Netherlands where there are

comprehensive precautionary land improvement schemes, and in certain areas of Germany with the growing recycling of industrial land.

## Trade trends

Overseas contracts represent a more important proportion of the overall business of the civil engineering sector than in building construction; here again, however, there is a clear and continued decline in all branches of civil engineering, particularly in countries such as the United Kingdom, France and Germany with their traditionally extensive involvements in overseas building.

European civil engineering contractors will find themselves faced with increasing changes in their competitive positions, and major construction projects outside Europe will only be implemented with publicly guaranteed finance. This means that market shares outside the European Community will be determined largely by financing requirements and conditions.

In terms of major construction projects outside Europe, the European civil engineers will also be adversely affected by the fact that bi-national and multinational finance institutions are becoming increasingly reluctant to become involved in project-related financial backing. A further factor is the growing activity by non-European and domestic civil engineering contractors in these markets as additional competitors with earnings-related competitive advantages. So as not to sacrifice their traditional market shares entirely, European civil engineering firms are operating to an increasing extent through local subsidiaries and shareholdings.

The effects of the general mandatory re-

quirement throughout Europe to put contracts out to tender for major public-sector construction projects could augur particularly well for the civil engineering industry, although at present the success of the relevant directives varies widely among individual members of the European Community, and no realistic pronouncements can as yet be made regarding the new legislation.

For major European civil engineering projects, cooperation among civil engineering contractors of different nationalities is proving to be a viable option, as in the case of the proposed construction of the new Grosse-Belt Tunnel or the tunnel near Turin.

## Employment trends

Trends in employment in the civil engineering industry display a pattern similar to tendencies in building construction. This implies a rising need for highly qualified personnel, both on the technical/technological and the commercial and managerial sides of the business.

Moreover, one peculiar feature of civil engineering can be observed, which has not the same effect in the building construction industry: while shifts in the emphasis of production by companies in the latter industry are perfectly feasible from one building branch to another, the civil engineering sector is almost totally unable to attune itself to change in the same way. Moreover the individual branches of building construction follow quite different economic cycles, while the various branches of civil engineering are still consistently dependent on public-sector budget and finance with the result that they are always affected by the same cycles of the economy.

A downturn in activities - such as happened in the Seventies and more particularly during the Eighties - means that all branches of civil engineering are affected simultaneously, leading to disproportionate capacity setbacks and comprehensive redundancies even of highly skilled employees.

The present and future re-expansion in the volume of civil engineering construction demands a renewed build-up of skilled personnel resources. The labour market and educational and training systems are not entirely prepared to cope with this demand, especially in terms of the highly specialised skills that are needed.

This is a situation that has already attained drastic proportions in countries like Spain, Portugal and Greece following four years of consistently above-average growth rates in the industry, but since similar situations exist in neighbouring countries as well, potential international operations by civil engineering companies can offer little appreciable relief.

## Special features and outlook

New points of emphasis in civil engineering are coming to the forefront, e.g. environmental investments and the improvement and technological upgrading of existing infrastructure resources with the resulting knock-on effects on the structure of civil contractors and the make-up of their personnel.

In the area of finance, the growing demand for infrastructural investments of supranational significance is forcing a discussion on financial ways and means, especially the involvement of private investors not subject to the constraints of government budgetary policies. This is of greatest significance for major investments in the communications infrastructure within an overall European framework, in which participation by private capital is seen as an inevitable prerequisite by the EC Commission and the European construction industry alike.

The influence of events in Central and Eastern Europe on civil engineering can-

not be presently predicted with any degree of confidence. The objective need is obviously immense, and the financial aspects equally difficult.

Even the effects of the German economic and currency union cannot yet be forecast with any detail over the coming years; its dynamic will doubtless have far-reaching consequences for the civil engineering sector right across Europe. The expansion and redevelopment of the public infrastructure in the eastern regions of Germany may be largely governed by the general movements in interest rates, costs and budgets given the extensive use of public-sector funding.

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The industrial plant-making sector worldwide has benefitted from a favourable climate as regards industrial investment in most of the industrialised countries.

Investment rates have been particularly high in the United States and the EC. A few sectors such as energy and the petrochemical industry have fared exceptionally well thanks to the application of new production processes which will reduce the cost price while at the same time allowing for ecological constraints.

Overall, on the basis of a world survey into current trends, it is estimated that in 1989 the world market for major projects involving industrial plant and large-scale civil engineering works increased by approximately 20% compared with 1988. During this period, EC plant-makers increased their volume of business by nearly 15% and retained their position as the leading exporters of industrial plant, ahead of Japan and America, although the latter greatly enhanced their share of the export market.

The geographical shift which occurred on domestic markets around 1985 and the move towards more solvent markets in order to reduce the financial risks attached to mega-projects in numerous Third World countries have had a positive effect on the sector's trading results.

More recently, EC plant-makers have responded to the prospect of a single mar-

ket by consolidating their policy and pressing ahead with mergers and acquisitions with intra-EC partners who can either broaden their technological expertise in the form of new processes or a specialist knowledge of advanced techniques, or reinforce their local operations and extend their market share, while at the same time obeying the rules of normal competition.

**Table 1**  
Industrial engineering - Changes in the world plant-making market

| (billions ECU)                | 1980 | 1982  | 1986 | 1987 | 1988  | 1989  |
|-------------------------------|------|-------|------|------|-------|-------|
| Total amount of the contracts | 77.6 | 125.5 | 61.0 | 86.6 | 102.0 | 113.4 |

Source: Europlant

## Description of the sector

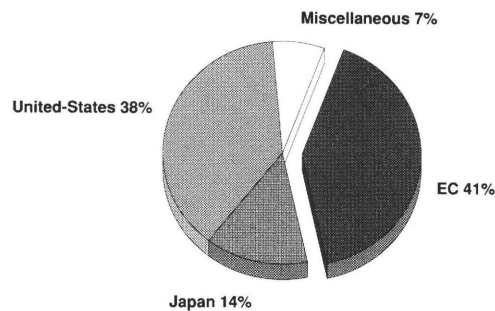
Industrial plant-making largely consists of supplying services: feasibility studies, technical process studies, market research, location studies, architectural and civil engineering studies, coordinating with subcontractors, activities linked to site management, assembly, staff training and the supply of capital equipment and systems. The relative importance of these different areas varies considerably depending on the industrial sector concerned and the type of contract. Owing to the specific nature of these contracts, however, they do not feature as such in any statistical records. In order to make up for this lack of relevant statistics, in 1970 the European Committee of Plant-makers introduced a single model for gathering data on the sector's activities. This system has not yet been adopted by all the EC countries and is therefore of limited use. However, a number of studies and activity reports compiled by national associations make it possible to discern certain patterns within the sector and to compare data.

The plant-making sector is also significant because it has a powerful catalytic effect on the capital equipment sector. Plant-makers both prescribe and supply capital equipment, which they then implement using their specialist know-how. In addition, a large number of plant-makers are first and foremost machine manufacturers. All the major mechanical engineers and electrical engineers within the EC are plant-makers who carry out a large part of their

activities within the framework of large-scale industrial projects. Such firms rank, moreover, among the largest in the sector within the EC: Ansaldo, Mannesmann Anlagenbau, Fiatimposit, Spie Batignolles, Siemens, ABB Lummus Crest, Technit, Danieli, Astaldi, Air Liquide, Cockerill Mechanical Industries, Fl. Schmidt, Krupp, Polysius, Nuovo Pignone, Fives Coil Babcock, Alstom, B.M. A., Bühler KHD Humboldt Wedag, Linde Schloemann-Siemag.

## Current situation

**Figure 1**  
Industrial engineering  
The world market for plant-makers, 1989



Source: Europlant

**The world plant-making market** During 1989, the climate proved particularly favourable to the construction and industrial plant-making sector, with industrial plant-making contracts amounting to 113 billion ECU, i.e. 11% up on the previous year. This increase in business applied worldwide but was slightly more pronounced in the case of EC plant-makers whose internal market expanded at a higher rate. The early 1980s were particularly favourable, as the sector embarked upon the final phase of various major industrialisation projects in a large number of develo-

ping countries.

In this respect, 1982 proved to be a record year, with 125.5 billion ECU. From 1984 onwards, however, the market began to collapse, reaching its lowest point in 1986, with a turnover of 61 billion ECU. Since then, there has been a marked recovery.

The distribution of market shares remains fairly stable.

EC plant-makers remain at the top of the league, closely followed by the Americans, whose growth rate for the past 2 years has exceeded that of the EC.

American engineering firms, however, are still the world leaders in terms of both their technological capabilities and size.

The list of the top 250 engineering firms worldwide is clearly dominated by American companies.

As a brief reminder, the leading firms are: ABB Lummus Crest, Bechtel, Brown & Root, Foster Wheeler, Fluor Daniel, Badget, M. W. Kellogs, Davy McKee, Ponsons, McDermott.

The unit value of projects is on the increase, significantly enhancing the profitability of projects. For a number of years, profit levels had been very low, seriously handicapping the sector.

A general breakdown of contracts per in-

**Table 2**  
Industrial engineering  
Breakdown of contracts  
by industrial sector, 1989

| (%) |                                   |
|-----|-----------------------------------|
| 32  | Oil, gas, petrochemicals          |
| 28  | Power generation and distribution |
| 12  | Iron and steel & metallurgy       |
| 12  | Chemicals                         |
| 6   | Food industry                     |
| 4   | Cellulose and textiles            |
| 6   | Miscellaneous                     |

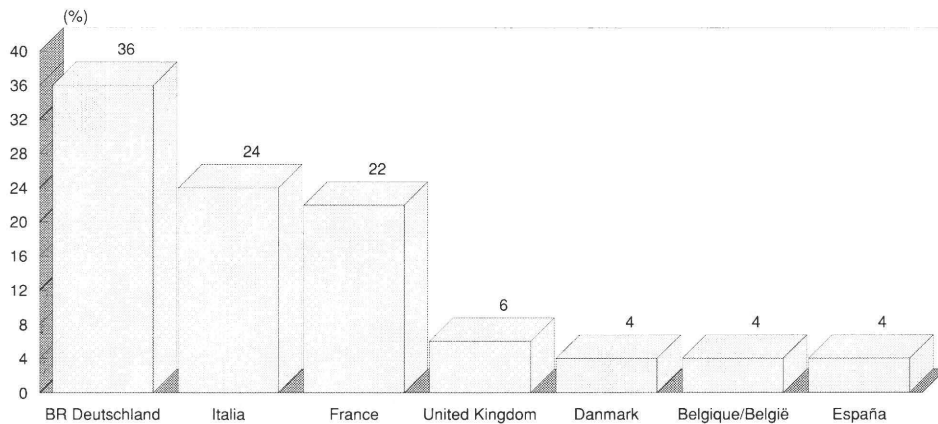
Source: Europlant

dustrial sector is given in table 2.

The sectoral breakdown still points to a concentration of projects in the energy, oil and petrochemical industries, whereas projects in the environmental protection sphere are still few and far between, in spite of the size of the potential market.

**The EC market in 1989** Within the EC, business in the plant-making sector has

**Figure 2**  
Industrial engineering  
Breakdown or activity by Member State, 1989



Source: Europlant

been sustained by a favourable economic climate.

Contracts awarded in 1989 are estimated to have been worth a total of 42 billion ECU. Figure 2 illustrates the breakdown of the plant-making sector's activities per Member State.

The total turnover achieved within the EC is estimated at 22 billion ECU, i.e. 52% of the total turnover, thus indicating a fairly even spread of activities between EC mar-

kets and export markets.

In 1988, turnover on the export markets stood at 20 billion ECU, compared with only 16 billion in 1987, i.e. an increase of 25%. Most EC plant-makers have significantly improved their services on the export markets; similarly, several contracts of above-average value have had a positive effect on the relative importance of the export market.

**Japanese plant-makers** The Japanese share of the export market for large-scale industrial projects and infrastructures on the world market was estimated at 10.4 billion ECU in 1989, i.e. approximately 8% of the world export market.

Asia and the Middle East account for around 80% of Japanese plant-makers'

pean investors with the necessary financial backing could also help to improve their performance. Up until now, Japanese companies have not engaged in acquisitions or mergers with EC plant-makers.

Table 3 shows that plant-making tends to be confined to a limited number of large Japanese firms and that the average value of exports per firm is very low; instead, the market is made up of a large number of low-value contracts. More recently however, the unit value of contracts has tended to increase.

**American plant-makers** According to a survey compiled by the journal ENR on trends in the world construction and plant-making market, in 1989 the American engineering industry increased its share of the export market, which now stands at around 23% of the world market. 1989 was clearly a year of recovery: the value of export construction and plant-making contracts reached approximately 33.7 billion ECU, whereas contracts relating to industrial investment alone amounted to 23.1 billion ECU, i.e. a 15% rise compared with 1988.

From a geographical point of view, the situation visibly improved on both the domestic market and the two main export markets - Western Europe and South-East Asia.

Exports by American plant-makers are

**Table 3**  
Industrial engineering  
League table of Japanese plant-makers  
in 1989  
(billion ECU)

| Company                     | Turnover |        |
|-----------------------------|----------|--------|
|                             | total    | export |
| JGC Corp                    | 3.311    | 2.634  |
| Mitsubishi Heavy Industries | 5.634    | 1.360  |
| Kagima Corp                 | 10.580   | 0.620  |
| Toyo Engineering            | 1.020    | 0.510  |
| Chiyoda Corp                | 1.584    | 0.437  |
| Sumitomo Construction       | 2.110    | 0.311  |
| Mitsui Construction         | 2.411    | 0.166  |
| Nishimatsu Construction     | 3.380    | 0.220  |
| JDC Corp                    | 1.420    | 0.110  |
| Hitachi Plant Engineering   | 1.130    | 0.040  |

Source: Europlant

market whereas the European and American markets barely account for 3%. In terms of geographical diversification, therefore, Japanese plant-makers differ markedly from their European and American counterparts. In order to achieve success on the European market, however, they will have to adapt their strategy, which up until now has not regarded this as a priority objective. Greater involvement on the part of Japanese banks, capable of providing Euro-

evenly spread throughout the world: 30% in Europe, 20% in Asia, 20% in the Middle East and 18% in Africa.

For American plant-makers, the 1990s look exceptionally promising, with excellent prospects in a number of sectors such as environmental protection. In order to pinpoint this market, American plant-makers will have to forge closer links with their EC counterparts. The search for suitable partners will therefore be a top priority.

## Employment

The capital equipment and plant-making sector employs a large workforce, although the numbers were significantly reduced at the beginning of the 1980s, following cuts in investment.

1988-89, however, should see a significant upturn in employment levels and already in some regions, there are signs that the job market is becoming tighter.

In most countries, appropriate measures are being taken to combat the lack of skilled specialists, firstly by bringing higher education more closely into line with the industry's needs and secondly, by reinforcing vocational training.

Meanwhile, when it comes to special, highly skilled tasks, many companies are calling on sub-contractors and temporary staff, including in the case of senior executive jobs.

This skills shortage will further encourage companies to acquire competing firms which can provide the new owners with a surplus of staff specialising in much-needed techniques or in partnership agreements.

## Outlook

The short-term prospects point to continued growth; 1989 was marked by two major events, however, which could have

a significant impact on the plant-making industry in the medium-term. The first was the collapse of Communism in Eastern Europe, which should generate enormous demand in terms of renovating and reconstructing the region's industries. The opening up of these markets represents a priority objective for a large number of EC plant-makers, although much will depend on political preconditions and the availability of financial resources. Secondly, the conclusion of the Lomé IV convention, which will govern cooperation and development relations between the EC and the ACP states for the next ten years, should serve as a positive factor in the problems of Third World countries. The war in the Gulf, on the other hand, constitutes an element of uncertainty on the markets, since unstable oil prices could have serious repercussions on the drop in profitability of investment projects, thereby triggering a cut in such investments.

Efforts by the industry worldwide to improve profitability and cut its production costs ahead of the single European market and the reinforcement of the Japanese and U.S. industrial blocs are undoubtedly a factor in the upsurge in industrial investment which has benefitted the plant-making sector since 1988.

Projections relating to investment in the petrochemical, chemical, refining, natural gas and synthetic fuel sectors point to a worldwide increase of around 7% for new investment, maintenance and running costs; as regards expenditure on new investment, however, the figure is over 13%, thanks to buoyant demand and the gradual impact of environmental protection measures in those industrial sectors which cause most pollution.

According to several indicators, however, in 1990-1991, in the sectors examined above, the EC should see a higher rate of investment than the average for Western countries as a whole.

In addition, the gradual creation of a cohesive European area, capable of handling major technological changes and improving the quality of life, will help to generate large-scale projects throughout the EC: examples include the railway programme, the renovation of the airport infrastructure, off-shore energy development in the North Sea and the reinforcement of the gas infrastructure in the southern Member States of the EC.

**EUROPLANT: European Committee of Plant-Makers.**

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