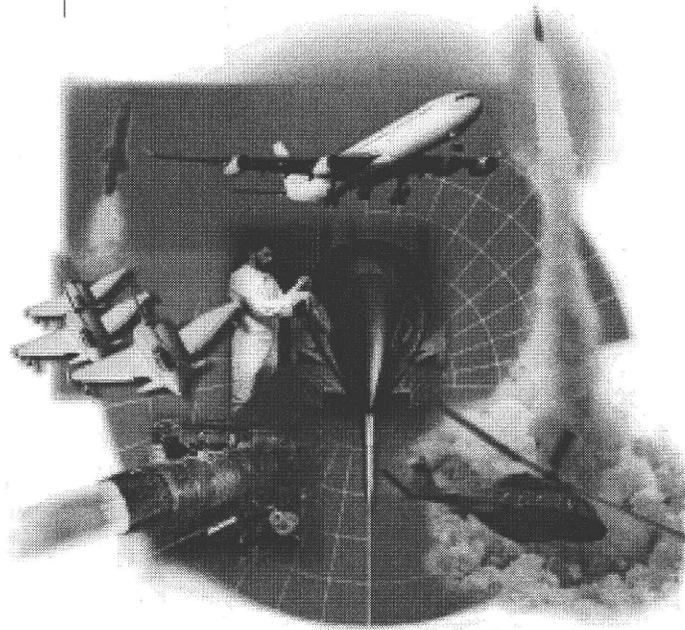


The  
European  
Aerospace  
Industry



**Results**  
of the **1997**  
**Statistical**  
**Survey**

AECMA

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## Introduction

The data and information provided in this booklet represent the results of the statistical survey among the European Aerospace Industry (EAI) for 1996. Although AECMA has for a long time provided statistical data to others, in particular to the European Commission, it is here for the first time that AECMA on its own publishes comprehensive statistical data about the EAI. In addition, the results of the 1996 survey feature some data for the first time:

- Data has been collected not only from the AECMA-member companies, but also from other aerospace-related companies - EU-consortia like Airbus Industrie, airline maintenance companies and others, in all EU Member States - thus truly reflecting an EU-picture of the EAI. However, the EAI statistics as presented here do not include the thousands of supplier companies throughout the EU, unless they are AECMA members.
- Data for aircraft and missiles have been collected separately.
- Trade Balance data has been established.
- Expenditure-data for Research and Development (R&D) is presented.
- It has been possible to separately identify data for:
  - Small and Medium-Sized Enterprises (SMEs) as well as
  - Maintenance business

Major figures of the European Aerospace Industry for 1996 are:

|                    |                   |
|--------------------|-------------------|
| • Turnover:        | 44 Billion ECU    |
| • Employment:      | 343.400 employees |
| • R&D Expenditure: | 18,3% of turnover |
| • Trade Balance:   | +18 Billion ECU   |

## Trends

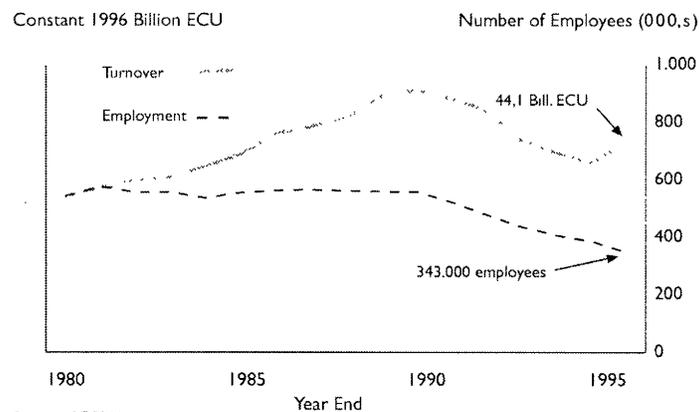
After years of declining sales, resulting from the end of the Cold War with its drastically reduced military market, as well as the strong and sudden recession in civil aircraft demand in the aftermath of the Gulf War, the EAI has shifted back to growth. Compared to 1995, sales grew by 12% in 1996, see figure 1. This trend is expected to continue during 1997, mainly because of the increased demand for civil aircraft. Long term market forecasts indicate a sustained overall growth of the aerospace business with individual segments ranging from stable demand to vigorous increase, and all segments being subject to cyclical developments.

Due to substantial gains in productivity, the increased output of the Industry is, however, now achieved with less direct personnel. This trend is likely to continue as a result of rationalisation and restructuring, common to all manufacturing industries.

One has to bear in mind, that there is substantial additional employment within the supply chain outside the actual Aerospace Industry which is presented here. This additional employment is estimated at approximately another 700,000 jobs. A substantial amount of this has been transferred to the supply chain by outsourcing services in the rationalisation process.

While for the last 15 years or so the respective share of sales to EU Governments (incl. ESA, national aerospace research establishments and agencies) and other customers has been about 40% vs. 60%, respectively, in 1996 it changed to 30% vs. 70%, see figure 2. This can be explained by the combined effects of the return to considerable demand for civil aircraft and the only marginal increase in military markets.

Figure 2: EU Aerospace Industry Turnover<sup>(\$)</sup> and Employment<sup>(\*)</sup>

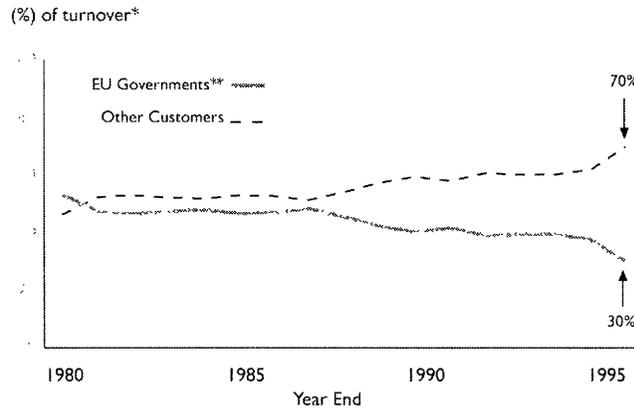


Source: AECMA

(\*) consolidated

(\$) incl estimations for Sweden until 1991 and non-AECMA companies until 1995

### EU Aerospace Industry Turnover\* by Customer

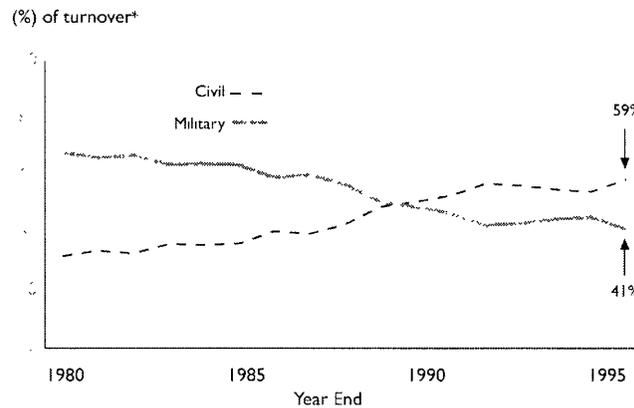


Source: AECMA

(\*) based on consolidated turnover in constant 1996 prices, incl estimations for Sweden until 1991 and non-AECMA companies until 1995

(\*\*) incl. ESA, national aerospace research establishments and agencies

### EU Aerospace Industry Turnover by Customer



Source: AECMA

(\*) based on consolidated turnover in constant 1996 prices, incl estimations for Sweden until 1991 and non-AECMA companies until 1995

In comparison to the US, where the corresponding figures are 48% and 52%, respectively, the EAI depends on a much lesser extent on Government contracts.

Historically, the EAI evolved from a military-oriented industry but has changed over the years to an increasingly civil-oriented industry, see figure 3. Since 1989 civil markets have a higher share of the EAI than military markets, although the relative shares in 1995 were close to 50% each. For the reasons described above, the civil share increased to 59% in 1996 while the military share decreased to 41%.

# Turnover

Total turnover of the EAI in 1996 was 44,1 Billion ECU. Of this, 92% has been generated by the major European aerospace countries, France, Germany, Italy and the United Kingdom and 94% by companies represented by AECMA.

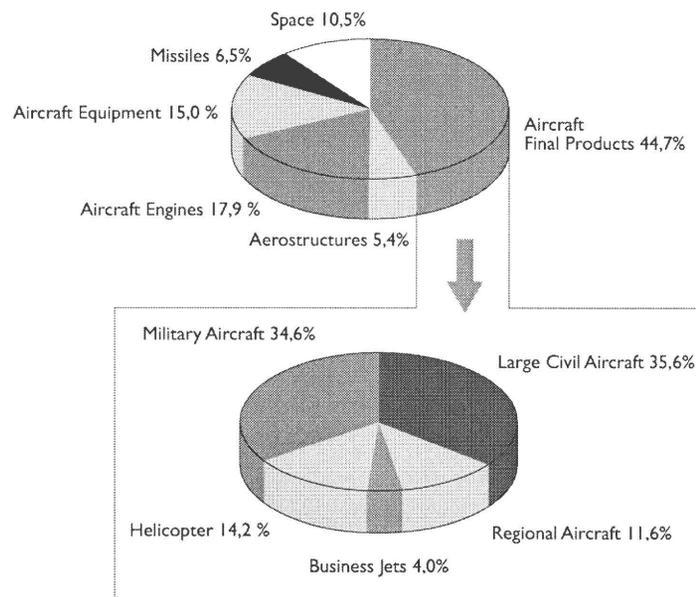
The aerospace industry is generally subdivided into the Product Segments *Aircraft* (including helicopters), *Missiles* and *Space* and the Industry Sectors *Aircraft & Systems*, *Engines* and *Equipment* (for further explanations see Annex). Turnover (and employment) information is detailed for these Segments and Sectors.

Figure 4 shows the distribution of the EAI's turnover by Product Segments. As can be seen, aircraft production dominates the product range with civil *Aircraft* being the single largest contributor.

Figure 5 demonstrates the relatively low dependence of the EAI in 1996 on contracts acquired from EU Governments. Except for *Missiles*, "Other Customers" are largely dominant in all Product Segments and Industry Sectors.

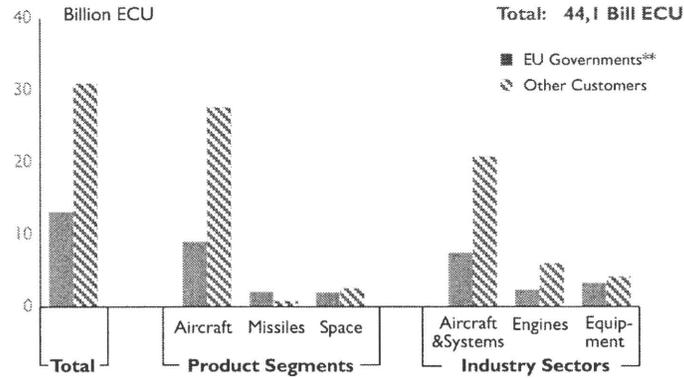
**Fig. 4:** Breakdown of 1996 EU Aerospace Industry Turnover\* by Product Segment

Total: 44,1 Bill ECU



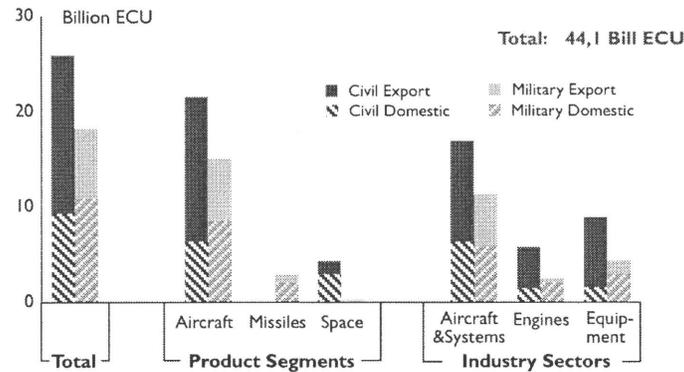
Source: AECMA, Aircraft breakdown estimated  
 (\*) based on consolidated turnover

**Fig. 5: Breakdown of 1996 EU Aerospace Industry Turnover\* by Customer**



Source: AECMA  
 (\*) based on consolidated turnover  
 (\*\*) incl. ESA, national aerospace research establishments and agencies

**Fig. 6: Breakdown of 1996 EU Aerospace Industry Turnover\* by Customer**



Source: AECMA  
 (\*) based on consolidated turnover

The split between civil and military turnover for the Product Segments and Industry Sectors can be seen in figure 6. It should be noted, that the *Aircraft* business reflects the overall ratio of civil to military business, as the exclusively military business of *Missiles* is compensated by *Space* being predominantly civil.

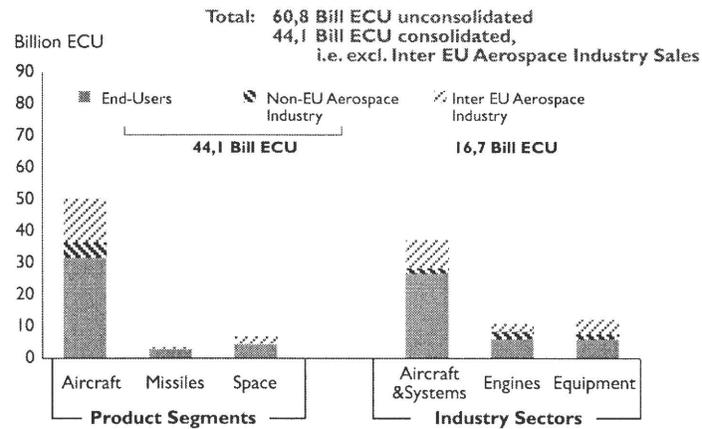
The export split by Product Segments and Industry Sectors is also given in figure 6. Civil *Aircraft* are the single largest contributor to the total export figure.

The relevance of the EAI internal trade as well as its role as supplier to aerospace companies outside the EU can be seen in figure 7. As it turns out, for all Product Segments and Industry Sectors there are more sales to End-

Users than to the EAI. This is particularly notable for the *Engines and Equipment* Sector underlining their competitiveness outside the EAI environment.

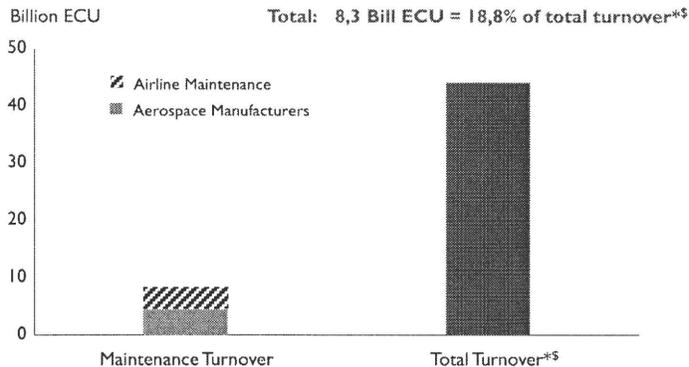
A significant part of many aerospace companies' business which are represented by AECMA relate to maintenance activities. Thus, the aerospace maintenance activities of EU companies not represented by AECMA must equally be considered to be part of the EAI. This is particularly true for the large maintenance workshops at EU airlines, of which some are AECMA members while others are not. Total turnover resulting from sales of maintenance services reached about 8 Billion ECU in the EU which corresponds to 19% of total turnover, see figure 8.

**Fig 7:** Breakdown of 1996 EU Aerospace Industry Turnover by Customer



Source: AECMA

**Fig 8:** 1996 EU Aerospace Industry Turnover\* resulting from Sales of Maintenance



Source: AECMA

(\*) based on consolidated turnover (\$) incl. maintenance

## Employment / Industry Structure

Total direct employment in the EAI in 1996 was 343.400 employees. The additional indirect employment within the supply chain (not represented here) is estimated at around twice the above number of jobs again. The overall employment generated by aerospace in the EU is therefore approximately 1 million people.

About 56% of the EAI's activity in terms of employment is with prime contractors or overall system level companies, see figure 9. These companies are complemented by an *Engine* Sector with a share of about 21% and *Equipment* Sector with a share of 23% of the EAI's employment.

Since employment broadly correlates to value added - except for potential differences in productivity - the appropriate weight of these Industry Sectors in the development and manufacturing process is better expressed by their share of employment rather than of turnover because the turnover distribution by Sector only shows sales to End-Users and aerospace companies outside of the EU. However, *Engine* and *Equipment* Sectors also supply a substantial part of their output to the EAI's *Aircraft & Systems* companies.

It should be noted, that almost 90% of all direct aerospace employees in the EU are related to the production of *Aircraft* as opposed to *Space* (7%) and *Missiles* (5%).

Aerospace companies are based in all EU Member States and therefore all Member States contribute to the European aerospace business. The core of the Industry is, of course, located in the 4 Member States with the largest economies (i.e. France, United Kingdom, Germany, Italy), followed by groups of countries which host structured aerospace industries with activities in most segments, comprising of Spain, Sweden, the Netherlands and Belgium. Figure 10 gives the EU Member States' contribution to the EU Aerospace Industry's employment.

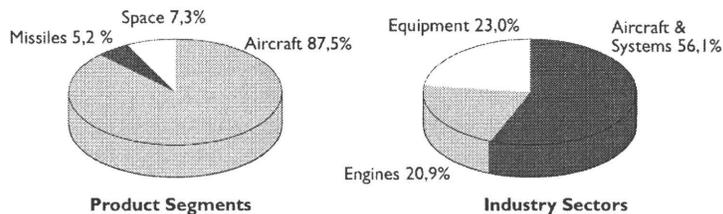
The EAI provides highly skilled jobs. 25% of all employees have a university degree or equivalent, see figure 11. Most of "Others", which accounts for 34% of all employees and includes technicians, draughtsmen, craftsmen, secretaries, accountants, etc., have enjoyed an education at institutions up to university level. And even most of the Manual Workers, which account for 41% of all employees, have been well trained either within the EAI or externally to cope with the sophisticated nature of the aerospace technology.

Most employees work in the field of Production, see figure 11. However, the fact that 20% work in the field of R&D demonstrates again the relevance of R&D to the EAI.



**Fig. 9:** Breakdown of 1996 Direct EU Aerospace Industry Employment by Segment/Sector

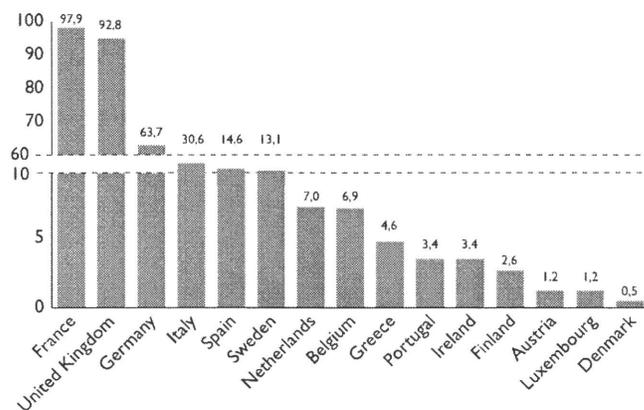
Total: 343.400 employees



Source: AECMA

**Fig. 10:** Contribution to 1996 Direct EU Aerospace Industry Employment

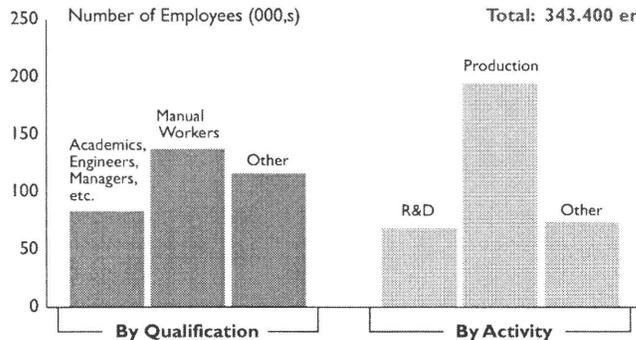
Number of Employees (000,s) Total: 343.400 employees



Source: AECMA

**Fig. 11:** Breakdown of 1996 EU Direct Aerospace Industry Employment

Number of Employees (000,s) Total: 343.400 employees



Source: AECMA

## Research & Development (R&D)

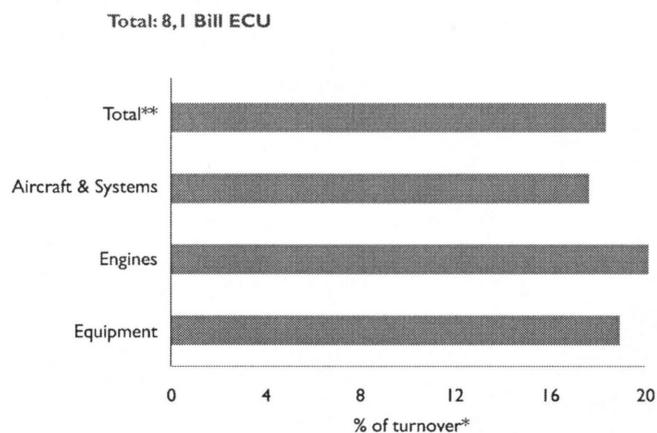
Various definitions of R&D exist and it is therefore difficult to achieve reasonably harmonised data throughout the EAI. For the purpose of this survey, R&D was defined to comprise:

- Research and Technology activities which represent all those R&D activities which are not directly attributable to products. They can, thus, be regarded as generic technologies and are designed to maintain or expand the technological basis.
- Development activities leading to series production.

Average R&D expenditure of the EAI reached 18.3% of total turnover in 1996, see figure 12. Compared to all other EU manufacturing industries, this R&D figure is much higher than the next industry sector which is Information Technology, where R&D expenditure is around 13% of turnover. This underlines the high technological level of the EAI.

The financing of the EAI's R&D expenditure is shown in figure 13. Company financing of R&D almost matches that by EU Governments, and is even higher for civil applications. This demonstrates the EAI's commitment to stay at the forefront of technological advancement.

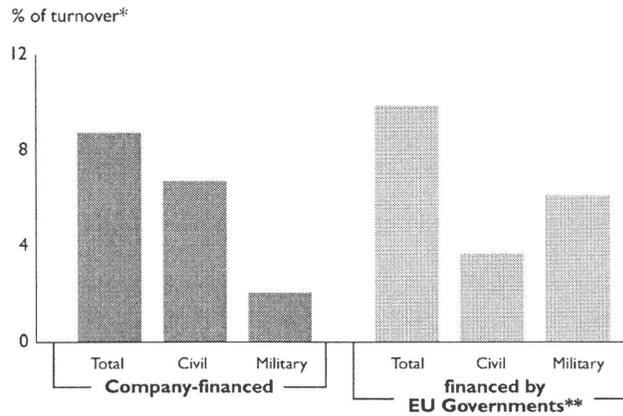
Fig. 12: 1996 R&D Expenditure\* of EU Aerospace Industry



Source: AECMA  
(\* consolidated  
(\*\*) weighted average

**Fig. 13:** 1996 R&D Expenditure\* of EU Aerospace Industry

Total: 8,1 Bill. ECU = 18,3% of turnover\*



Source: AECMA

(\*) consolidated

(\*\*) incl. ESA, national aerospace research establishments and agencies

## Small and Medium Sized Enterprises (SMEs)

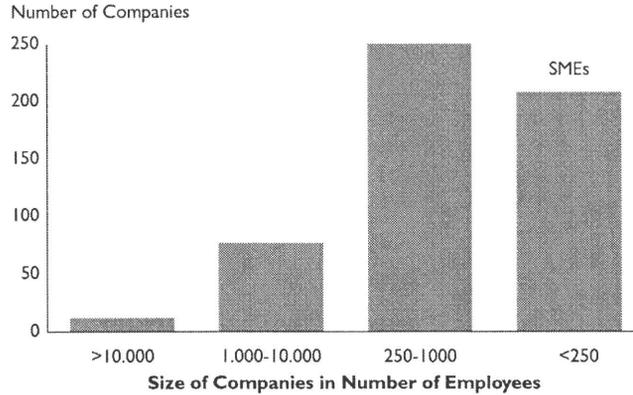
The EAI is characterised by a small number of very large firms, a larger number of medium sized companies, and a very large number of small enterprises, see figure 14. About 210 companies, or 38% of all companies belonging to the EAI in 1996, comply with the employment criteria of the definition of SMEs outlined by the European Commission.

In addition, there are an estimated 78.000 European suppliers of goods and services to the EAI of which about 10% are estimated to be SMEs, see figure 15. Thus, not only among the classical aerospace manufacturers as represented by the EAI, but also down the supply chain, aerospace provides impetus to a large number of SMEs within the EU.

The EAI's SMEs' turnover and employment for the various Product Segments and Industry Sectors can be seen in figure 16. In line with the overall Industry, SMEs are predominantly supplying to the *Aircraft* Product Segment. In contrary to the overall Industry, the vast majority of SME employment forms part of the *Equipment* Sector.

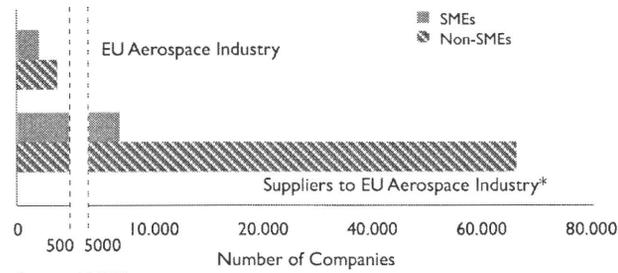
It is worth noting that the R&D expenditure in percentage of turnover for SMEs is the same as for non-SMEs, see figure 17 and 13. High R&D expenditure is therefore not only a characteristic of larger aerospace companies but of the EAI's SMEs, too.

**Fig. 14: Structure of the EU Aerospace Industry; 1996**



Source: AECMA

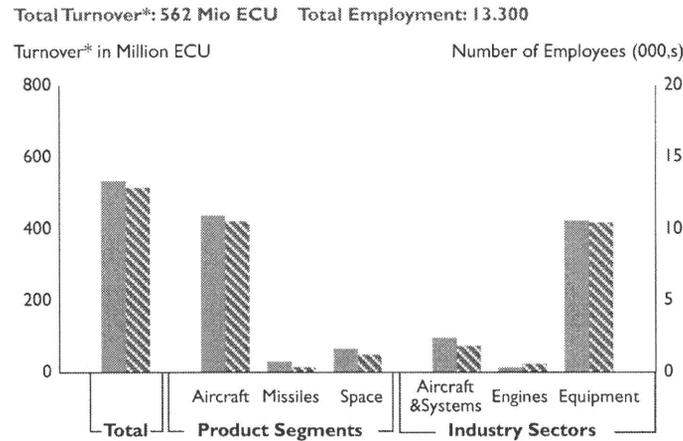
**Fig. 15: SMEs in the EU Aerospace Industry**



Source: AECMA

(\*) Number of supplier companies estimated by extrapolation of available data

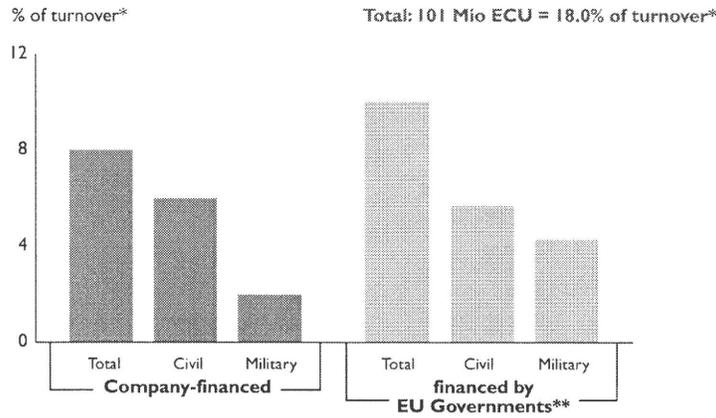
**Fig. 16: 1996 Turnover\* and Employment of EU Aerospace Industry SMEs\*\***



Source: AECMA

(\*) based on consolidated turnover    (\*\*) excl. suppliers to EU Aerospace Industry

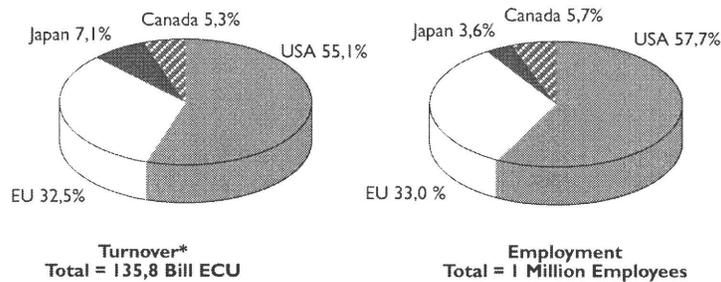
**Fig. 17:** 1996 R&D Expenditure\* of EU Aerospace Industry SMEs



Source: AECMA

(\*) consolidated (\*\*) incl. ESA, national aerospace research establishments and agencies

**Fig. 18:** 1996 Comparative Aerospace Industry Turnover\* and Employment



Source: AECMA, AIA, AIAC, SJAC

(\*) based on consolidated turnover

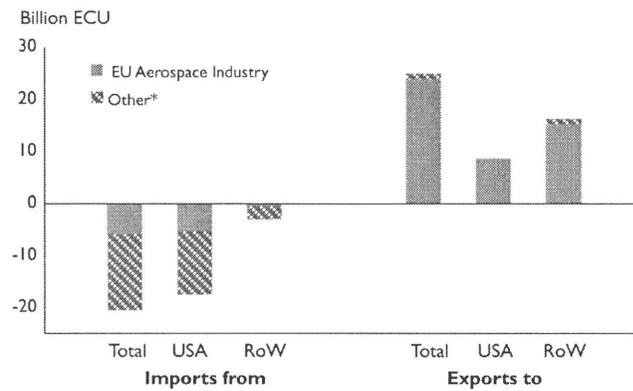
## International Aspects

In 1996, the largest aerospace producing nations of the world (except Russia and China, where data is difficult to obtain) achieved a combined sales volume of 136 Billion ECU. The EAI contributed 32% or 44.1 Billion ECU to this amount, see figure 18. The US Aerospace Industry, being almost twice as large in size as the European Industry, thus remains the dominant player in the global market place. However, the EAI is - in rough terms - about 5 times bigger than the Aerospace Industries of Japan and Canada.

Aerospace trade balances shown in figures 19 and 20 are based on aerospace relevant products and services. For the EAI, figure 19, this represents all exports minus all imports necessary to support production. For the overall aerospace trade balance of the EU, this takes all exports and imports into account, which would for example include imports of airplanes by EU airlines as well as exports of second-hand military aerospace equipment by EU Governments.

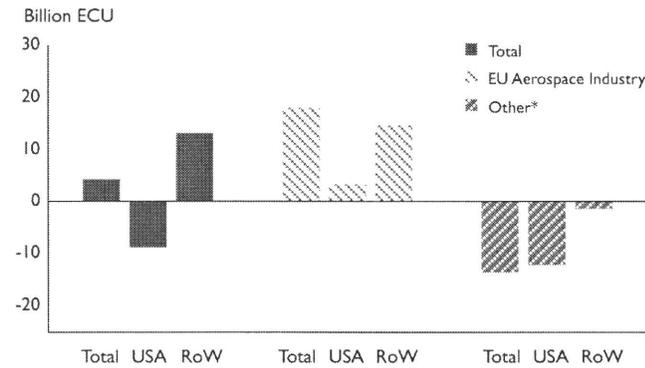
Although the EAI achieved a high positive trade balance of 18 Billion ECU in 1996 with countries outside the EU, the overall aerospace trade balance is considerably smaller, mainly due to the very high imports of aerospace products from the US by EU Governments and (to a lesser degree) EU airlines. It is worth noting, that the EAI achieves a positive trade balance even with the US.

**Fig. 19:** 1996 European Aerospace Import and Export of EU



Source: AECMA  
 (\*) estimated, incl. Governments, Airlines, etc.

**Fig. 20:** 1996 Aerospace Trade Balance of EU



Source: AECMA  
 (\*) estimated, incl. Governments, Airlines, etc.

# Annex

Total unconsolidated turnover is the sum of all turnover data provided by the companies (whereby at company level data is expected to be consolidated). Consolidated turnover at EU level is calculated as the total unconsolidated turnover minus the turnover resulting from sales between EAI companies. This consolidated turnover therefore represents all sales to End-User customers as well as to aerospace companies outside the EU.

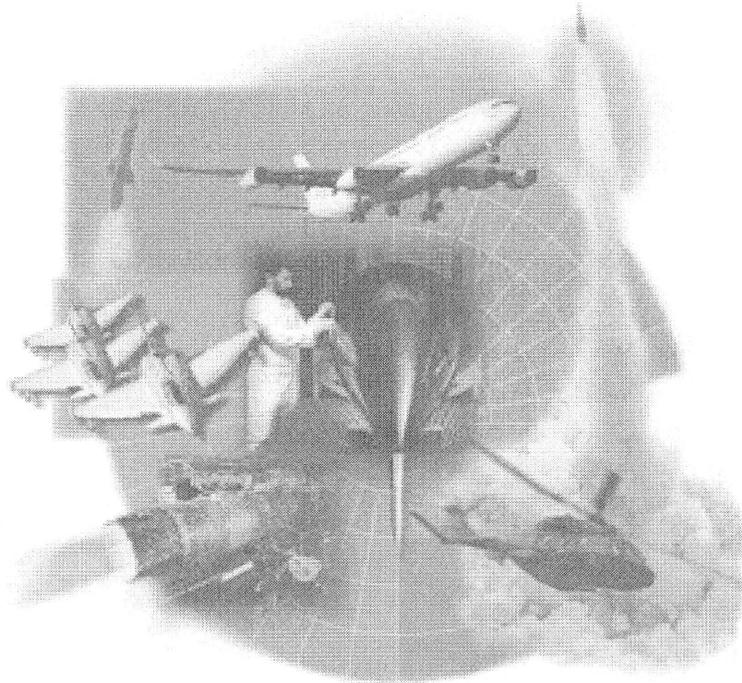
One peculiarity of the EAI are EU-Consortia like Airbus Industrie, Al(R), Euromissile, Arianespace, etc. . They are sales organisations without any production capabilities and are controlled by other EAI companies which usually also serve as suppliers to these EU-Consortia at the same time. EU-Consortia data is generally taken into account here, whereby sales by the EU-Consortia's shareholders to the EU-Consortia have been eliminated.

Figure 21 represents the definition used for the Product Segments and Industry Sectors.

Fig. 21: Breakdown of EU Aerospace Industry Turnover

|                  |          | Industry Sectors                             |                               |                                 |                                |
|------------------|----------|----------------------------------------------|-------------------------------|---------------------------------|--------------------------------|
|                  |          | Aircraft & Systems                           | Engines                       | Equipment                       | Total                          |
| Product Segments | Aircraft | a                                            | b                             | c                               | <b>Aircraft</b><br>= a + b + c |
|                  | Missiles | d                                            | e                             | f                               | <b>Missiles</b><br>= d + e + f |
|                  | Space    | g                                            | h                             | i                               | <b>Space</b><br>= g + h + i    |
|                  | Total    | <b>Aircraft &amp; Systems</b><br>= a + d + g | <b>Engines</b><br>= b + e + h | <b>Equipment</b><br>= c + f + i |                                |

■ Total unconsolidated turnover



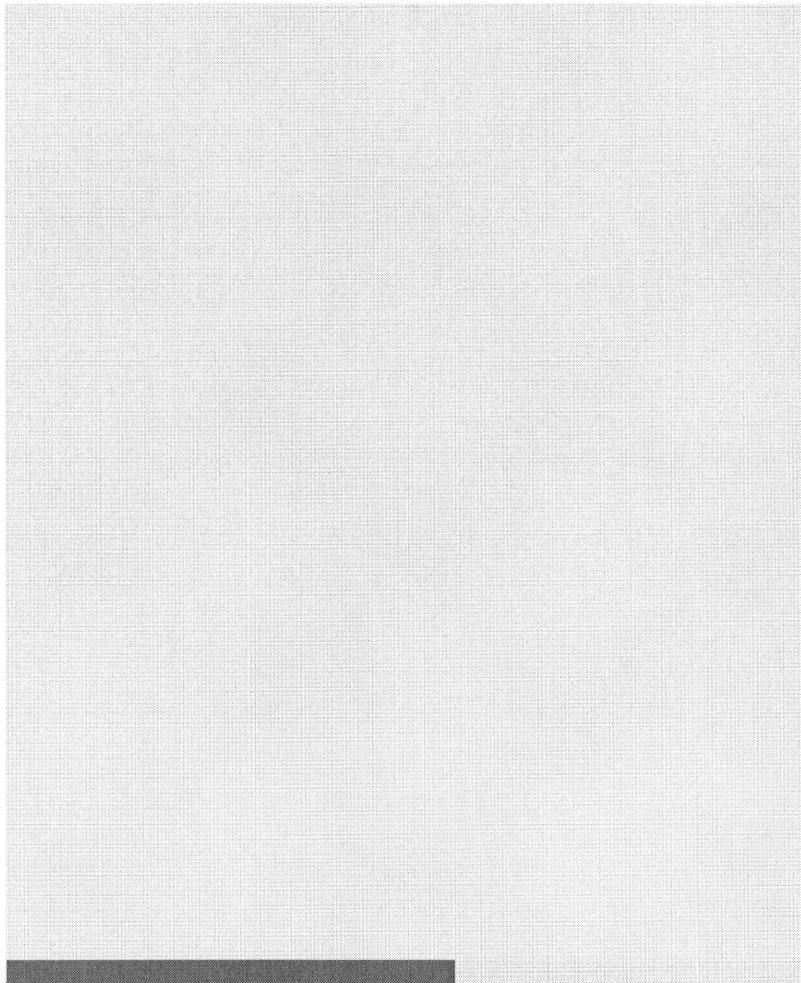
## Acknowledgements

This booklet has been prepared on the basis of the results of the 1996 statistical survey of the European Aerospace Industry, which has been prepared and performed by AECMA's Data Analysis and Statistics Working Group (DASWG) with the participation of experts from the national aerospace associations, companies of the EAI as well as the European Commission DG-III.

However, without the cooperative and most appreciated contributions from all the companies of the EAI who responded voluntarily to the questions raised by the survey, the results would never have reached this level of detail and sophistication.

Special thanks is therefore to be expressed to both the contributing companies and to the members of the DASWG as well as to the financial sponsors for the production of the booklet, which are listed below.





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The European Association of Aerospace Industries (AECMA) has the objective of promoting the competitive development of the European Aerospace Industry, and representing the Industry on a European level in all matters of common interest.

Members of the association are the national aerospace associations of Belgium, Denmark, Germany, Italy, the Netherlands, Spain, Sweden and the United Kingdom as well as the largest European aerospace companies. It thereby represents the European Aerospace Industry almost in its entirety on the level of aircraft/systems, engines, equipment and components.

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