

## SPACE ECONOMY

# Space as industrial base

Space activities still greatly influence global economy, much based on the space as unsurpassable basis for business areas like communication, navigation, earth observation and others.

The global space economy was in 2005 estimated to 140 billion Euros, and 60% of that mainly came from commercial products and services. Only in Europe the activities engaged more than 30 000 highly skilled persons. ESA, the European space organisation, place contracts in the European industry worth of close to two billion Euro a year, directly or through prime contractors.

Most of the European countries participate in the ESA-collaboration with different shares of the ESA budgets for mandatory activities in relation to the gross national product, and in addition, they participate in optional ESA-programmes and several types of bilateral projects. The ESA-programmes are mainly research based, but in spite of research is the main focus, the developing and production for advanced missions is technological driving. ESA also carries out commercially based technological programmes such as Alphabus, Small Geo Sat, Galileosat, Proba etc. and these are in many cases again form the basis for commercially products.

The space industry has different markets to compete in, and it delivers products for research missions, for

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commercial products and for launching of these. However, that only applies to the space segment, turnover from equipment for the ground segments and services for the user community has the largest volume. As examples, the Norwegian turnover of space-related products and services are about 750 million Euro, and that applies mainly to services.

### Increase the level of technology

Space activities contribute to increase the industrial activity in the European industry, but even more importantly, the activities also increase the technical competence in the industry itself. For the different countries the effect is close to the same. The activities ESA generate provide possibilities for engagement within the commercial space activities, thus, it increases the general level of technology, and provide better competition within other areas with high demand for technical competence.

ESA also influences the evolution through different types of technological developing programmes. Technology programmes form a part of ESA's budget at five percent which is distributed at the different technology areas in according to a running evaluation. To increase the possibilities for technological development for space the Innovation Triangle Initiative (ITI) was established. That contributes to developing ideas and products for use in space. On the other hand, hard to introduce products qualified for space for civilian commercial use the Technological Transfer Programme was established. In different way, the programmes contribute to increasing the benefit from space activities.



*Both small and large components, here represented with a very small valve and an attaching bar for Ariane 5, might provide a basis for developing work which will increase the competence of the companies.*

*Photo. Norwegian Space Agency and Kongsberg Defence and Aerospace.*

### What about the Nordic countries in all this?

The Nordic countries are relatively active within the space business area, and in some different fields, based on the geographical placing and their traditional industry, they are leading the way. Norway has the largest part of the turnover connected to services based on ground stations in the Arctic and Antarctica areas, and satellite communication services for the market. Sweden has also ground stations placed in the northern part of the country, but has in addition a very strong space related industry. Finland has much of the activity connected to developing and producing ground based equipment for space application, building structures

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for use in space and developing space instruments, while Denmark has a strong position within space research, together with developing and building satellite instruments and equipment, both for scientific tasks and for the commercial market.

The different countries also have running technological programmes to qualify their national industry for developing and delivering space related equipment. An example is the Finnish AVALI programme. Launched in 2002, the programme was intended to create new business opportunities, products and services based on space infrastructure and know-how created in space projects.

Common for the Nordic countries is their relatively large engagement within the space sector.



*Service for the space community form a large part of the activities in Sweden and Norway. Here the last preparation before launch of a sounding rocket from Esrange in the Northern Sweden. Photo : Swedish Space Corporation*

### Further rationalising necessary

In spite of the high activity, European space industry has several problems that need to be solved. The quantity of developing work has decreased recently. That provides a smaller growth in developing new technologies, thus, a weaker position in relation to the new and fast growing industrial superpowers. Strengthening the industry has provided fewer participants within the field, but the rationalising within the large companies has not had the same focus, and the European space industry has had a great over/capacity in several fields.

The industrial strengthening can have different types of effect. The well known Norwegian Nera Satcom was recently sold to the competitive Thorne & Thorne, Denmark, and has become a division of that company, ultimately forcing a merger between the two companies.

Saab Ericsson Space, Sweden, a well known supplier of electronic equipment for the space market, is another example. The company was sold in 2007, now wholly owned by the Saab Group and named Saab Space. Late in 2007, the division was laid out for sale, and may now risk being sold to foreigners.

On the other hand, when the French company Alcatel, closed down the activities at Alcatel Space Norway, the firm was taken over by the previous owners and is now the well known supplier Norspace, and stands perfectly on its own feet.

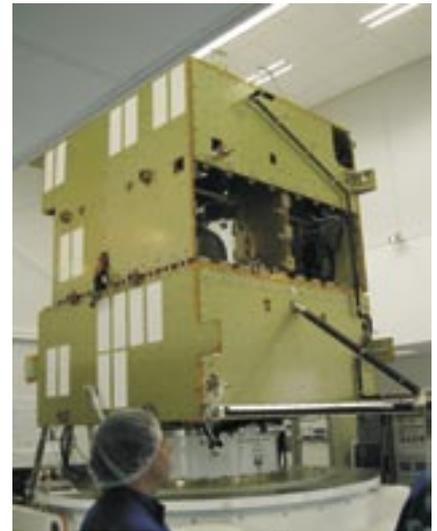
### What pushes development?

One way is more weight on education within the fields of natural science and technology. Common for the European countries is the decreasing number of children who want further studies within these fields, something that requires more focus in the years to come by all the European countries.

Another way is to see the possibilities. Most societies lack capability to see the possibilities space has as basis for further evolution on Earth. From the beginning the technological development was wholly technologically driven. The research community and the industry pushed forward the development of instruments and sensors for their own interests and then they sold the products and services to the user groups that might be interested. Fortunately, in recent years the development has been more focused on the users. This means that the user community has been more aware of the demands of the technology, thus pushing everything forward, however, not always to the degree one wishes.

### Industrial return and the voting system.

ESA's industry principle about fair return - industrial contracts in relation to the share in the different programmes - is for some countries a hindrance to show their technological and competitive level, and in some cases, the principle does not give ESA the best and cheapest technology for their project. It is not always that the



*Space structures for mspece delivered of the Finish industry. Here the Rosetta structure. Photo Nordicspace*

providing countries' industrial competence and quality has the same level as the national interest and financial power.

ESA has therefore faces challenges adapting purchase- and return rules to a modern industrial policy. Sweden, as an example, has had strong focus on the space industry for a long time, and developing and building national satellites has given them a leading role within several international projects. The Swedish industry has a higher competence and competition power than their participation share in ESA gives them possibilities to demonstrate.

The principle about fair return is therefore a principle under stress from different sources. The same is the voting system. The system with one-country one-vote policy was a good principle at the time the organisation was small and where the members shared the same interest in all projects. However, the organisation has continuously increased, and has today 17 member nations, still mainly nations from Western Europe, but the interest for membership is large. The number of new nations may cause higher market shares and most of the newly interested countries have or have had different political cultures and forms of government. The danger of blocking of decisions from countries with one-vote, but small shares can be the result. It is therefore natural that countries with large shares, and consequently large economical interests in the organisation, want a voting policy that more reflects the financial contribution.