Finnish research policy
Bringing space technology into use on Earth

One of many reasons why people in general accept spending large amounts of money on space research is the fact that the technology brings society a step forward and into use on earth. This is the main priority for most European countries, although they will reach their goals in many different ways.

Finland spends the most money on research and development (R&D) in the world in terms of the Gross Domestic Product (GDP) in the world, only topped by Sweden. Finland also has the most increasing high tech production in relation to the total production. Space technology is one of the fields where Finland has had great success and they spend relatively large amounts of money on bilateral programmes and in programmes related to the ESA membership. One of the goals with the Finnish engagement in space- and space-related research is that the result can provide practical benefits for the public. It would be interesting to find out how they have both reached this key position and how they will keep bringing more space technology into use on

"Connected all times all places" - a result of a clear strategy to bring Finland to the front in developing of new and usefu, technology.

Photo: Tekes/Niko Nurmi.

The Prime Minister shows the way - Finnish technology policy.

The collapse of the Soviet Union early in the previous decade and thus, the thirty percent drop in the export market, forced Finland to think in lines of new products and new markets. The strategy that was chosen to better the employment and economy was to make a strong bid for developing and producing high technology products. The choice has been a success and technology today constitutes an essential part of the Finnish industrial policy and acknowledgement at the highest level of the Finnish government. Key issues concerning technology are regularly discussed at the Science and Technology Policy Council, chaired by the Prime Minister of Finland.

Finland is increasingly invested in research and technology development and the R&D investment now totals 4.9 billion euros, 3.43 percent of the Gross Domestic Product (GDP) in 2003. The private sector share accounted for 3.4 billion euros. That gives a government input of 1.5 euros. Finland and France have the highest share of public investment in Europe with 0.99 percent of GDP. The means in EU is 0.77%.

The result of R&D investment is clearly visible in the structural change of the industry and in the wide range of Finnish high-tech exports. The electronics and electrical now represent the third strongest supporting arm of the Finnish national economy alongside with forest, metal and engineering industries.

The Ministry of Trade and Industry oversees Finland's technology policy. On an operational level Tekes independently promotes and co-ordinates R&D projects and programmes, in addition to maintaining co-operation within international networks.

Tekes works in collaboration with several partners within the Finnish innovation environment. For basic research, the main agency of implementation is the Academy of Finland. At the regional level, the T&E centres (Employment and Economic Development Centres) implement the technological policy. From a pure business perspective, the key partners are Sitra (the Finnish National Fund for Research and Development), Finnvera (Export Credit Agency), Finpro (Association for Internationalisation Services) and Invest in Finland.

The Technology Programmes.

To bring the technology development many steps further the National Technology Agency, Tekes, plays a very active role and manages close to 30 percent of the funding from the Finnish government. Much of the research and development is based on special technology programmes initiated by Tekes and consisting of numerous projects focused on key technology sectors.

The technology programmes are used to promote development in specific sectors of technology or industry, and to pass on results of the research work to business efficiently. Programmes have proved to be an effective form of co-operation and networking for companies and the research sector. During 2003, a total of 34 extensive national technology programmes were under way. In 2002, Tekes provided 20.4 million euros in financing technology programmes.

Companies, research institutes, and Tekes plan the technology programmes in co-operation, something that takes place in workgroups and open preparatory seminars. The decision of launching a programme is made by the board of Tekes. Each technology programme has its own board consisting of a co-ordinator and a responsible person at Tekes. The duration of the programmes ranges from three to five years; their volumes range from 10 to 120 million euros. Tekes usually finances about half of the costs of programmes. The second half comes from participating companies.

The main benefits lay in the close co-operation between research institutes and industry, the widespread involvement of small and medium sized companies, and the high level of international co-operation. All programmes and results are partially publicly financed.

International co-operation

Finland aspires to international participating in the R&D programmes to broaden the research basis and for quick implementation of the results. In some cases international participation is desirable to finance large projects. Finland participates in several large international programmes through membership in different international organisations. For space programmes most of the R&D is related to the ESA programmes.

There are different ways to enter the Finnish technology programmes

Joint Technology Programmes

Tekes actively encourages open co-operation on programme level and is eager to be involved in the preparation of joint technology programmes in co-operation with other funding authorities in different countries. Such programmes should focus on international co-operation and on how this can provide added value to the participants.

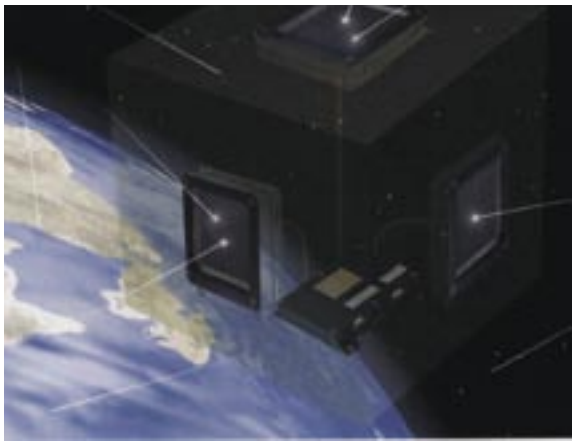
The JEM-X microstrip detector package, designed and fabricated of Metorex International Oy.

Tekes Technology Programmes

Foreign research institutes universities and enterprises benefit from direct access to top-level research and development projects within the Tekes technology programmes. The programme management organises opportunities for building partnerships between foreign companies and programme participants. Relevant costs of participation are primarily covered by the foreign entity itself or by national funding from its own country of origin.

Research Institutes and Universities

Research institutes and universities can become jointly involved or alternatively pair up with partners in industry. Public funding covers the costs of the research institutes and universities and each participant receives funding from its country of origin. The different forms of co-operation are, exchange of research information, joint research projects and mobility of researchers within collaboration projects.



Standard In-Situ Impact Detector (DEBIE) for space debris environment monitoring. Prime Patria Finavitec Oy Systems.

Industry

R&D co-operation for industry can be pre-competitive or it can lead to the creation of joint business based upon the results of the project. The benefits include a shorter time to the market with controlled risks as a result of close co-operation. Public funding covers R&D costs of the enterprises. Each enterprise receives funding from its own country of origin. Foreign enterprises can participate in Tekes technology programmes in four different ways, joint project, subcontracting, technology transfer and collaboration for marketing and distributing the project results