Latvia is a country with strong R&D traditions. World class specialists work in materials science, biotechnology, pharmaceuticals, ICT, and other fields. Consequently, the country can pride itself in numerous globally competitive high-technology companies that have succeeded in using the priceless knowledge derived from scientific institutions.

Investment and Development Agency of Latvia has a crucial role in the process of introducing and supporting novel ideas in the daily work of entrepreneurship. It has always been an active accelerator in promotion of innovation, supporting companies that are willing to advance their activities by exploiting new methods and ideas in the process of production and acting as a mediator between these companies and scientists and researchers who seek possibilities of realizing their findings and research results.

Hopefully, this brochure will be useful not only as a valuable source of information about R&D in Latvia and possible new business contacts but will also be a channel for bilateral partnership of ideas, technologies, and knowledge.
Then and Now…

Science Excellence

The adoption of Western European professional research traditions and trends can be traced back as far as the 16th Century to the work of quite a few private scientists and medical doctors.

The Courland Society for Literature and Art was founded in 1815. By 1915, 1124 people, including such world-famous figures in science as Karl Friedrich Gauss (mathematician), Nikola Karamzin (historian), Karl Ernst von Baer (biologist), Wilhelm Struve (astronomer), as well as Baltic scientists and workers in the arts (David Hierarchy Grindel, Garlieb Merkel, Johann Christoph Brotze), were elected members or honorary members of the Society. The work of Baltic German scientists dominated in Latvia until the middle of the 19th Century. The Courland Society and its founders also recalled the positive aspects of the Baltic German contributions to Latvia. By these traditions Latvia became richer and more European.

Riga Polytechnic Institute, shortly after its establishment in 1861, became one of the most prominent centres for training of qualified engineers and chemists in Tsarist Russia. The Institute employed famous scientists, including the Nobel Prize winners W. Ostwald and S. Arrhenius, as well as the chemist P. Walden, the pioneer of spacecraft engineering. F. Zander, the mathematician P. Boh, the physicist A. Toepeler, and many others.

War, emigration and Soviet deportations to Siberia substantially reduced the number of Latvian intellectuals. Most of the researchers who emigrated during the last years of the war continued their research in exile. Many Latvian researchers found new homes in the US and Western Europe, e.g., M. E. Straumanis, chemist and inventor of a specific X-ray crystal investigation method, J. Upatnieks, one of the inventors of holography, A. Padegs, the leading engineer of IBM, K. Počs, a designer of meteorological rockets, and others.

Konstantīns Počs, after more than 30 years of work in the US air force laboratory in Boston, became a leading designer of meteorological rockets and one of the creators of AWACS – a radar-based electronic system designed to carry out airborne surveillance and command, and control, and communications functions for both tactical and air defence forces. The system was designed and built by Boeing, with the aircraft currently in service in NATO and the air forces of the US, the UK, France, Saudi Arabia, and Japan.

After World War II the institutional framework of science in Latvia was redrafted and largely modelled upon that of the Soviet Union. A Soviet-type academy of sciences and in specialised industrial, medical, and agricultural research institutes. In the Soviet Union two main thrusts of research and development existed: (1) for the military complex and (2) for public needs. A number of outstanding research institutes, university laboratories and research schools in mathematics, solid state physics, laser physics, astronomy, chemical physics, organic chemistry, biotechnology, magnetohydrodynamics, and molecular biology had developed in Latvia by the end of the 1980’s. Many scientific schools were acknowledged in scientific circles, both in the USSR and world-wide.

An important characteristic of the Latvian R&D system today is its dynamic development. Over the last five years research has emerged as a priority for policy-makers in Latvia. R&D issues are seen as crucial for the development of a knowledge-based and sustainable economy, as well as to Latvia’s overall socio-economic development, and national economic competitiveness. This commitment has been demonstrated by increased public R&D funding, which had been neglected over the last 15 years. Similarly, new R&D funding schemes, financed from national funding sources as well as from the European Union Structural Funds, have been introduced. Before 2005 there were only a few research funding programmes (Basic and Applied Research Projects Programme, Support for Joint Research Projects and Support to market-oriented research). After the adoption of the Law on Research Activity (2005) and the receipt of Structural Funds most of today’s funding measures in Latvia have been launched. Specific priorities of R&D policy are the development of national R&D strengths in priority research fields, the promotion of science-industry cooperation, and raising awareness and interest in R&D issues in the private sector.

Winners of Nobel Prize in chemistry in 1909, Wilhelm Ostwald, was born in Riga in 1853 and worked at the Riga Polytechnic Institute (1881–1897). In 1886 the famous Swedish chemist, Svante Arrhenius, worked in Ostwald’s laboratory in Riga for six months while developing the basis of the electrolytic dissociation theory.

The camera VEF Minox, the first miniature (1.3×2.7×7.5 cm) camera in the world, is one of the most well-known Baltic inventions world-wide. The inventor of the VEF Minox, Walter Zapp (1905–2003), was born in Riga, Latvia. In 1896–1937, the Riga Electrotechnical Plant VEF developed production technology for his invention, the Minox.

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THE MAIN RESEARCH POLICY FUNDING TRENDS

Over the last five years include:
- establishment of thematic research programmes in priority research areas that have the potential to make a significant contribution to the competitiveness of the national economy;
- introduction of institutional funding in 2005 to strengthen research institutions, which earlier received only project-based funding;
- in 2004 implementation of the National Programme “Support for Modernisation of Scientific Infrastructure in State Research Institutions” was started, attracting European Regional Development funds (ERDF). For the EU Structural Funds’ 2007–2013 planning period it is foreseen that further support will be provided for the renovation of research institutions and the modernisation of research equipment, as well as the enhancement of availability and the modernisation of ICT to promote increased human resources for research;
- introduction of a new measure “Support to the implementation of doctoral programmes and post-doctoral research” (2005), to facilitate the renewal of human resources in R&D. “Development of Tertiary Education” is a programme launched in 2009 to continue support for improving the quality of tertiary education studies and programmes, increase the proportion of students in masters and doctorate study programmes, and to raise the professional and research qualifications of academic personnel;
- emphasis on supporting the applications of research results (2005 and 2006). For example, via the newly set-up technology transfer offices in higher education establishments;
- development of scientific and research potential and capacity, attracting supplementary human resources to science and research, cooperation improvement among higher education institutions, research centres and enterprises, improving research and innovation policy and administration, and contributing to the awareness of society about the role of science and research via the EU Structural Funds’ measure “Development of Scientific and Research Potential”;
- setting up of thematic research programmes in priority research areas that have the potential to make a significant contribution to the competitiveness of the national economy;
- establishment of thematic research programmes in priority areas of research to promote the development of these scientific disciplines and facilitate their contribution to the competitiveness of economy and advancement of society. For 2008, 13.5MEUR out of 62.5MEUR allocated by the Ministry of Education and Science was spent on the nine state research programmes:
  - information technologies;
  - organic chemistry and biomedicine;
  - materials science;
  - forestry and wood sciences;
  - Letonica (Latvian language, history and cultural studies);
  - energy;
  - environmental research;
  - agro-biotechnology;
  - medical science.


Programme “Attraction of Human Resources to Science” – 53MEUR
Programme “Support to Implementation of Doctoral and Master Studies” – 89MEUR

Priority “Science, Research and Development” – 280MEUR:
Programme “Support to Science and Research” – 60MEUR
Programme “Development of Science Infrastructure” – 165MEUR
Programme “Improvement of ICT and Information Systems for Scientific Work” – 47MEUR

EU Structural Funds Year 2007–2013 Priority “Higher Education and Science” – 148MEUR:
  - Programme “Attraction of Human Resources to Science” – 53MEUR
  - Programme “Support to Implementation of Doctoral and Master Studies” – 89MEUR

Priority “Science, Research and Development” – 280MEUR:
  - Programme “Support to Science and Research” – 60MEUR
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THE PRIORITY AREAS OF RESEARCH

The state research programmes are established in priority areas of research to promote the development of these scientific disciplines and facilitate their contribution to the competitiveness of economy and advancement of society.

Top scientific achievements in Latvia include:
  - development of new organic materials for direct recording of surface relief holograms in the red region of the spectrum (Faculty of Materials Sciences and Applied Chemistry, Riga Technical University); materials have high durability, impact resistance, are free of shrinkage cracks, and combine high tensile strength with high workability. Materials are easy for preparation, transportation, casting and compaction. Tensile strength up to 25 MPa was achieved. Fibre concrete parameters were validated by industrial pumpability tests, as well as full-size structural tests, where scale factor values were obtained.
  - detection of the surface properties of strontium titanate that are promising for remarkable improvement of operation of information processing devices (Institute of Solid State Physics, University of Latvia).
  - creation of effective luminescent sensor materials of a new type that are used for the measurement of oxygen quantity (Institute of Solid State Physics, University of Latvia).
  - elaboration of a new, more capacious optical storage device consisting of several layers of thin tungstates (Institute of Solid State Physics, University of Latvia).
  - elaboration of the holographic recording of immersion method, enabling the recording of holographic gratings with a very small (90 mm) period (Institute of Solid State Physics, University of Latvia).

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- energy;
- environmental research;
- agro-biotechnology;
- medical science.

MATERIALS SCIENCE

Materials science has established scientific traditions in Latvia. Problems in materials science are researched and studied at the University of Latvia: Institute of Solid State Physics, Institute of Polymer Mechanics, Institute of Chemistry and Faculty of Materials Science and Spectroscopy and at the Riga Technical University: Institute of Inorganic Chemistry and Faculty of Materials Science and Applied Chemistry, and in some companies. Research topics correspond to development trends in materials science in the world and are related to the development of new functional materials, polymers, metal and ceramic composites, biomaterials, plasma-chemical technologies of nanomaterials, various protective coatings, and the control and protection of materials. Research is conducted across a broad collaboration of Latvian and foreign investigators.

Research is performed in the following directions:
- perspectively inorganic materials for photonics and energetics;
- prospective wholly-organic materials for opto- and micro-electronic and advanced methods for structure investigation;
- materials for photonics and nanoelectronics based on novel functional low molecular organic compounds and polymers;
- prospective biomaterials and medical technologies, development of technologies of nanoparticles, nanostructured materials and thin films for functional materials and composites.

The University of Latvia and the Riga Technical University Centre of Biomaterial Innovation and Development have a laboratory structure suitable for human arteries, ever existing biomechanical features, as they are biologically harmless.

Fibre concrete and high performance fibre concrete with steel fibre comprising up to 400 kg/m3 were developed at Riga Technical University.

Materials have high durability, impact resistance, are free of shrinkage cracks, and combine high tensile strength with high workability. Materials are easy for preparation, transportation, casting and compaction. Tensile strength up to 25 MPa was achieved. Fibre concrete parameters were validated by industrial pumpability tests, as well as full-size structural tests, where scale factor values were obtained.

Institute of Solid State Physics of University of Latvia, in cooperation with JSC “Sidrabe”, developed a special translucent electrode material for elements of solar batteries “Sidrabe”. In this collaboration deals with the development of advanced solar cell technologies and equipment, including vacuum coating equipment.

Pulsing blood-vessels prostheses produced with weaving technology using a complex, hollow wetting pattern and composite, non-toxic material executing functions of collagen and elastic fibres when the implant is adopting and functioning in the organism; developed at Riga Technical University.

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**INFORMATION TECHNOLOGIES**

The total share of information science sector goods and services in Latvia's GDP has increased from 3.2% in 1997 to 6% in 2003. Latvia has a very good potential for further development of the sector, and it is related to specialists who have acquired adequate education and have worked both in research and in the development and production of new products. This is proven by the rapid development of the information science sector against the general background. There are three main scientific centres of information science:

1. Institute of Mathematics and Informatics of University of Latvia;
2. Institute of Electronics and Computer Science;
3. Riga Technical University.

Research is performed in the following directions:

- development of software technologies based on model transformations;
- the advancement of Semantic Web technologies for practical use in Latvia;
- development of competitive ICT technologies on the basis of original approach to digital signal processing;
- application of accumulated knowledge for development and production of innovative ICT hardware;
- innovative communication technologies;
- resolution of industrial production problems on the basis of ICT technologies.

**BIOMEDICINE AND PHARMACEUTICALS**

Biomedicine and pharmaceuticals have established scientific traditions in Latvia. Problems in these sciences are solved at the University of Latvia, Institute of Organic Synthesis, Biomedical Research and Study Centre, at Riga Stradins University, and in some companies. Basic science research is performed in cooperation with the University of Waterloo (Canada); Grindex and Olanpharm Research. Research topics correspond to development trends in biomedicine and pharmaceuticals in the world and are related to the development of new pharmaceuticals.

In cooperation with UK and Danish partners, a new anti-cancer drug (currently under 2nd phase clinical trials in the US and the EU) has been developed. Scientists of the Latvian Institute of Organic Synthesis were involved in both design of the active entity and synthetic development of the molecule, which is now undergoing 2nd phase clinical trials in the US and the EU as second generation Alzheimer disease medication. A new class of anti-cancer agents that effectively fight pancreatic tumours was also discovered at the institute.

Latvian Biomedical Research and Study Centre deals with the construction of original virus-like vectors for development of new generation vaccines, gene therapies, and diagnostic preparations. New vectors and vaccine models have been developed through perennial cooperation with the Swiss company Cytos Biotechnology AG. Based on these developments, several therapeutic vaccine candidates in different stages of clinical testing have been produced. The Centre has also developed new hepatitis B, hepatitis C, and melanoma vaccine candidates based upon its original, virus-like vectors.

**WOOD CHEMISTRY**

Selection of the priority area and development of the state research programme "forestry and wood processing technology" has been guided by the following considerations. Firstly, forests are one of the most important global and national sources of renewable resources. The forestry sector of Latvia provides up to 60 thousand jobs in Latvia and supplies up to 40% of Latvia's export, with approximately 80% of forestry products being exported. Secondly, forestry research has established scientific traditions in Latvia. The priorities of the Programme are forest development, rational utilisation of wood biomass, and chemical processing of timber.

In Latvia, the rise in the proportion of goods and services of the information science sector against the general background of other economic sectors is significant. The total share of information science sector goods and services in Latvia's GDP increased from 3.2% in 1997 to 6% in 2003. Latvia has a very good potential for further development of the sector, and it is related to specialists who have acquired adequate education and have worked both in research and in the development and production of new products. This is proven by the rapid development of the information science sector against the general background.

**MEDICINE**

In order to ensure sustained economic and social development, it is important to investigate possibilities for improving population health and prolonging the working life of people. Statistical data reveal an unsatisfactory state of health of the Latvian population. The project themes to be implemented in the framework of the State Research Programme correspond to the major groups of pathologies negatively affecting the length of the population lifespan and its quality of life: cardiovascular diseases, infectious diseases, infantile diseases and the major chronic lung diseases. The main objective of the programme for 2006–2009 is to carry out a scientific investigation of the major pathologies affecting the health of the population and the quality of life in Latvia by a multidisciplinary research consortium.

Selection of the priority areas and development of the respective State Research Programme have been guided by the following considerations. The medical sector in Latvia provides specialists with the required competencies, qualifications and experience as well as high development potential, and vast opportunities for putting it into practice (clinics and diagnostic centres). There are rather strong and internationally recognised research institutes for the development of this field in Latvia — scientific units of the University of Latvia, Riga Stradins University and the Biomedical Research and Study Centre.

In cooperation with the German company ASTRUM GmbH in 2007, developed a new generation cryogenic isolation material of foam polyurethane class to be used for Ariane 5 rocket modernization programme of the European Space Agency.

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Research is performed in the following directions:

- development of new methods of early diagnostics, prevention and treatment of cardiovascular diseases;
- efficient and modern development of heart surgery in Latvia – development of new treatment methods and optimisation of the existing ones;
- development of diagnostic methods for identification of risk factors of malignant tumours, early diagnostics of tumours and precancerous state, optimisation of tumour therapy;
- hereditary tumours, their clinical and molecular investigation, prevention, and development of an early diagnostic strategy;
- elaboration of modern measures of early diagnostics, prevention, and therapy of diseases affecting infant mortality and disability;
- development of modern, technology-based algorithms of diagnostics and treatment of hereditary pathologies of children and adults; reduction of infant mortality by means of improving early diagnostics, treatment results and prevention of life-threatening infectious diseases in Latvia through application of the modern methods of molecular biology, cytology, and immunogenetics;
- development of modern measures of early diagnostics, prevention, and therapy of obesity-linked diseases and diabetes mellitus.

**Top scientific achievements in Latvia include:**

- Development of new methods - microbiotics and peeling of microlayers - for the purpose of analyzing the structure and surface properties of papermaking fibres (Latvian State Institute of Wood Chemistry).
Higher Education Basis for Growth and Development

The Development Plan for 2007-2013 states "educated and creative personality" as one of its three priorities. For decades people of Latvia have been quite famous for the overall high level of education. In the academic year of 2006/2007 Latvia had the second best performance in the world in terms of number of students per 10,000 inhabitants, namely 566 students (EU average: 371). There is a strong educational base in both the humanities and the sciences. Visitors are often surprised at the level of knowledge of foreign languages, especially English, which should not be surprising, considering the fact that the language is taught in 98% of secondary schools and is studied by 88% of schoolchildren. There is also high proficiency of the Russian language, which is largely due to social and historic circumstances.

In total, there are 34 institutions of higher education in Latvia along with 26 colleges. While most of them are in Riga, there are also some of great importance situated in the regional cities of the country, such as Daugavpils (Daugavpils University), Ventspils, Valmiera, Jelgava, Liepaja (Liepaja University), and Rezekne. The three largest universities (Daugavpils University), Ventspils, Valmiera, Jelgava, Liepaja (Liepaja University), and Rezekne. The three largest are also high proficiency of the Russian language, which is largely due to social and historic circumstances.

The University of Latvia, with its 24,000 students, 13 faculties and more than 20 research institutes, is the largest comprehensive university in the Baltics. The University offers more than 150 state-accredited academic and professional study programmes. One can obtain an academic bachelor's or master's degree in humanities, pedagogy, social sciences, sciences, and health. Doctoral study programs offer degrees in biology, economics, computer science, demography, pharmacy, philosophy, philosophy, physics, geography, geology, engineering, law, chemistry, communication studies, medicine, mathematics, pedagogy, politics, psychology, sociology, theology, religious studies, management, linguistics, history, and environmental science.

Riga Technical University (RTU) has 17,000 students; it is an accredited, internationally recognized European level university offering high-class academic and professional study programmes. RTU, via studies in its 8 faculties: Architecture and Urban Planning, Civil Engineering, Computer Science and IT, Electronics and Communications; Engineering Economics, Materials Science and Applied Chemistry; Power and Electrical Engineering; Transport and Mechanical Engineering, has provided excellent education for many prominent specialists, high-class professionals and researchers. RTU has opened 30 research laboratories and centres and 33 research institutes. It offers opportunities for studying part-time and in correspondence departments. RTU has affiliations in the largest towns of Latvia – Daugavpils, Liepaja, and Ventspils.

Latvia University of Agriculture (LLU) is a multi-profiled university; areas of study, as well as research, deal with agriculture, forestry, food technology, veterinary medicine, civil and environmental engineering, economics, education, social sciences, and information technologies. LLU is the only higher agricultural education establishment in Latvia which, amongst other objectives, aims to promote intellectual potential for rural development in agriculture.

Top scientific achievements in Latvia include:
- introduction of a new technology into haematology patient care that will remarkably improve the possibilities of treating the patients with acute and chronic leukosis. The new technology involves autologous peripheral blood stem cell transplantation (Riga Stradins University; Riga Aastruum Hospital, clinic "Linezers");
- development of new optical methods for the diagnosis of skin and blood vessel disorders (Institute of Atomic Physics and Spectroscopy, University of Latvia, in collaboration with the Faculty of Biology and Institute of Cardiology, University of Latvia);
- discovery of the link between the polymorphism of interleukine-1 gene and the inflammatory markers in coronary heart disease embodying a significant supplement to the existing knowledge about the causes of this disease and assisting in choosing a proper therapy for patient treatment (Biomedical Research and Study Centre of the University of Latvia; P. Stradins Clinical Hospital);
- a successful first operation of heart transplantation in April of 2002 (Professor Romans Lacis);
- the 1000th renal transplantation operation was performed in the P. Stradins Clinical University Hospital (Professor Rafals Rozentals).

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The University of Latvia, with its 24,000 students, 13 faculties and more than 20 research institutes, is the largest comprehensive university in the Baltics. The University offers more than 150 state-accredited academic and professional study programmes. One can obtain an academic bachelor's or master's degree in humanities, pedagogy, social sciences, sciences, and health. Doctoral study programmes offer degrees in biology, economics, computer science, demography, pharmacy, philosophy, physics, geography, geology, engineering, law, chemistry, communication studies, medicine, mathematics, pedagogy, politics, psychology, sociology, theology, religious studies, management, linguistics, history, and environmental science.

Riga Technical University (RTU) has 17,000 students; it is an accredited, internationally recognized European level university offering high-class academic and professional study programmes. RTU, via studies in its 8 faculties: Architecture and Urban Planning, Civil Engineering, Computer Science and IT, Electronics and Communications; Engineering Economics, Materials Science and Applied Chemistry; Power and Electrical Engineering; Transport and Mechanical Engineering, has provided excellent education for many prominent specialists, high-class professionals and researchers. RTU has opened 30 research laboratories and centres and 33 research institutes. It offers opportunities for studying part-time and in correspondence departments. RTU has affiliations in the largest towns of Latvia – Daugavpils, Liepaja, and Ventspils.

Latvia University of Agriculture (LLU) is a multi-profiled university; areas of study, as well as research, deal with agriculture, forestry, food technology, veterinary medicine, civil and environmental engineering, economics, education, social sciences, and information technologies. LLU is the only higher agricultural education establishment in Latvia which, amongst other objectives, aims to promote intellectual potential for rural development in agriculture.
Riga Stradins University trains world-class physicians, dentists, pharmacists, and nurses, as well as specialists in rehabilitation, public health, and the social sector. The university is targeted toward professions that are very much in demand for society today.

Being situated in regional parts of the country does not obstruct universities in becoming important study and research centres. For example, in cooperation with partners from European countries (especially Northern Europe) and other countries of the world, Ventspils University College has been participating in several important state and international projects of science and applied research in IT and e-administration, the analysis of business environment, and applied linguistics and linguistics.

Through the establishment of affiliates, the existing universities are actively involved in the growth of numerous regions of Latvia, raising trust in the rapid decrease of inequalities in regional development.


Financial support – National Support Programmes

If you are interested in national financial support for your business activities, then attention should be paid to the EU Structural Funds’ Operational Programme “Entrepreneurship and Innovation.” Of all EU Operational Programmes, companies may apply to this one for financial support, and the amount of the support ranges from 30-60% in a non-repayable grant. The period of operation of those Programmes is for 2007-2013.

The Programmes of interest for you as a foreign entrepreneur are:

- Development of new products and technologies - 25-35% (up to 0.5 MEUR) grant for development and implementation of new products or technologies.
- High – value added investments - 25% (up to 4.3 MEUR) grant for the establishment of hi-tech sites; includes both, production & service hi-tech.
- Competence centres – 40-75% (up to 4.9 MEUR) grant for the creation of research infrastructure to encourage cooperation of the research and industry sectors in the implementation of projects of industrial research (applied research) and the development of new products and technologies.
- Attraction of highly qualified employees – 40%-50% (up to 60 000 EUR per year) grant for remuneration of high-qualification specialists; work of specialists is related to solving of technological problems or development of new products.
- Support training for employees to enhance competitiveness of enterprises - 30-80% (up to 60 000 EUR) grant for market research, export strategy and partner matchmaking; several activities may be implemented simultaneously.

The Programmes are managed by the Investment and Development Agency of Latvia (LIAA), and guidelines, call for bids dates, and all relevant information are available at www.liaa.gov.lv and www.esfondi.lv.
To reach balanced growth in an innovation system, the above-mentioned investment in R&D from the EU Structural funds is divided into 4 main categories: science; education; businesses; transfer of technology and knowledge into infrastructure.

In each of these categories, several grant systems are available for reaching particular aims. After making the investments, i.e. in 2013, the capacity and effectiveness of the innovation system should be growing substantially.

As direct results, 10 high-tech production facilities are planned to be supported for this period, 420 new products put into production, 360 commercialised ideas, 420 new products, 360 commercialised ideas, and more …

At present, there are 13 business incubators actively operating in Latvia. Some of them have started or expanded their activity within the framework of the Innovation Centres and Business Incubators Programme of the Ministry of Economics (launched at the beginning of 2007).

Further activities of business incubators will be financed via support of EU Structural Funds. The support program will be launched in the 2nd quarter of 2009 with the total funding reaching 28 MEUR.

For the development of small and new companies, the availability of risk capital is essential. In Latvia, apart from private investors, risk capital is available from several institutions set up for this purpose. With help from the state, the European Investment Fund is managing ERDF financing for risk capital. Funding is also available from three risk capital funds: ZGI Fund (www.zgi.lv), INVENTO (www.techventures.lv) and the Second Eko Fund (www.ekoinvestors.lv). Overall, there are around ten different risk capital funds operating in Latvia.

The European Investment Fund (EIF) and Latvia signed the first Funding Agreement in the Baltic States under the European Commission’s JEREMIE initiative. EIF activities will include the development of new financial engineering structures and products, primarily in venture capital, seed capital, and guarantees benefiting Latvian SMEs (small and medium-sized enterprises) and micro-enterprises for the funding period 2007-2013. This initiative is part of an overall Government programme to stimulate further dynamism in the Latvian economy, which will translate into higher growth, renewed and enhanced job prospects, and a healthy and expanding SME sector.

To simply shorten the way in this manner to access the technological creative resources of Latvia.

Name | Location | Internet
--- | --- | ---
Jelgava Innovation centre | Jelgava | www.jic.lv
BITIS LUA BIC – Business and Technology Incubator of Latvian University of Agriculture | Jelgava | www2.llu.lv/homepg/bits/
Livani Engineering and Innovation Centre | Livani | www.kic.lv
Ogre business and innovation incubator | Ogre | www.ogabi.lv
Business Incubator of Rezekne Higher Education Institution | Rezekne | www.ieduvesinca.lv
Latvia Technology Park | Riga | www.rtp.lv
Latvian Technological Center | Riga | www.innovation.lv/rtc
Medical Engineering Innovation Centre of Riga Strads University | Riga | www.rsu.lv, mac@rsu.lv
Tukums Business and Technology Incubator | Tukums | www.tbt.lv
Valmiera Business and Innovation Incubator | Valmiera | www.vbi.lv
Ventspils High Technology Park Business Incubator | Ventspils | www.vartp.lv
Ventspils Digital Center | Ventspils | www.rtu.lv

Education – 100 new technology study programmes;
Business – 1200 person-months of innovation by staff;
Technology and knowledge transfer infrastructure – 7 additional competence centres, a number of new business incubators and technology transfer centre created.

In addition to these activities it is also planned to strengthen or create sector clusters, which, to a large extent, relates also to the promotion of innovation.
Globally Competitive High Technology Companies

Here you will not find all technology companies of Latvia which can offer valuable innovations. Here are some interesting examples of companies which characterise the diversity of innovative solutions in Latvia. These are companies that have successfully found their niche in the international market and most likely can become your partners, in case we have guessed your needs by selecting them.

Algorego
Algorego has developed a compressed database technology for data storage that significantly reduces storage requirements while keeping data accessible online. Data compression ratios reach 1:40, while the data access and query time remains below 1 second. Size decreased by 35-45 times, while at the same time query performance remained comparable to any other solution. For IT communications specialists this will certainly seem interesting as this is the way of processing telecom call log files. This kind of solution is certainly interesting also for other sectors, not only for telecommunications operators – everywhere where large bulk data is developed and access must be quick.

At present, the company offers two developed products, the Algorego Software development kit (hardware-use efficiency increasing tool for programmers) and the MySQL storage engine (the solution for applications that run on MySQL servers). Before acquiring additional data storage facilities, you should become acquainted with Algorego.

www.algorego.com

Arcus Elektronika
Arcus Elektronika's specialisation is the development and integration of highly-specialised and innovative industrial electronics and information technology solutions that fit customers' needs in the best way. The company produces more than 10 groups of products, including voltage quality analyzers, SCADA systems and software, transducers, and earth-fault protection relays.

The company operates as a research, development and small-series production company. Among the clients of the company are such large energy sector representatives as Siemens, ABB and General Electric.

www.arcel.lv

Asla Biotech
When talking about biotechnology, very rarely are things simple. Asla Biotech is a company which deals with the service of biotechnological methods such as gene synthesis, DNA/RNA, protein separation, monoclonal antibodies, etc. The work carried out by the company is complicated, and its customers are significant. For example, Cytos Biotech AG, Karolinska Institute (SE), National Institutes of Health (US), NASA Institute of Science and Technology (JP), Australian National University, and others are among the clients.

www.asla-biotech.com

Autonams
The company is a spin-off of the well-known Institute of Solid State Physics of the University of Latvia, where hologram production technologies were acquired. The main commercial product of the company is holograms for the protection of goods and documentation. Also, at present the company cooperates closely with the laboratory of the Institute of Solid State Physics of the University of Latvia in the improvement of knowledge and technologies. The company found its profitable the printing industry, and expanded rapidly its activity in the industry. We are sure that, if there are prospects for new solutions and applications in holography, Daredze will be the company to introduce them into production.

www.dardedze.lv

Biosan
The philosophy of the company is to develop modern, exciting, personal products for sample preparation in the field of genomics, proteomics, and cellomics. Biosan has focused its efforts on sample preparation to help minimise the number of mistakes during procedures. Mistakes accumulate due to smaller sample volumes used, lack of intermediate temperature control during mixing, and lack of systems for air deactivation in laboratories during operation. To meet these demands, Biosan has created a range of personal, compact, multifunctional products with an elegant design.

The company is a spin-off from the Institute of Microbiology of the Academy of Sciences and, after successful commercialisation of ideas, it has attracted investments from the leader of its sector. At present, the production of the company is known worldwide with brands like Bioeco, Kiser Biotech, Grant-bio, Seoulin Biosciences, Iwaki, and Lab4You.

Biosan
www.biosan.lv

Biotecnicus
The company operates with automation for manufacture, public utilities, and environment processes. The technology discovered in manufacture automation is used in almost all of the largest Latvian productive enterprises.

An international scale the company is known for its bioreactors - stainless steel (51 and 30) and glass (5l) laboratory bioreactors. Bioreactors are equipped with a special electromagnetic drive developed by the company itself, which ensures convenient servicing and good aseptic properties.

www.bioreactors.net

Biosan
www.biosan.lv

Brometec
Back in 1966 the Riga Research and Development Institute of Radio-Hotope Apparatus was founded. This Institute was the basis for creating the company Baltic Scientific Instruments, which later merged with companies of the Bruker group.

The Brometec company specializes in the development and serial production of spectrometric devices based on semiconductor silicon, high-pure germanium, and cadmium-zinc-tellurium detectors. The company's products are applied in the nuclear energy, ecology, geology and mineral resource industries, medicine and research activities, customs control, and other spheres.

www.brometec.lv

Ellat
Companies dealing with the production and application of various powerful electric machine-tools face the problem when, switching on an electric motor, it is struck by sudden load at the start-up, causing excessive wear of belts, pulleys, and bearings. Fonons developed and produces a new-type of electrical equipment, launching device, thyristor start, which allows significant improvements in the prevention and reduction of the above-mentioned problems.

Fonons also works on the development and production of improved aircross compressors. Very recently the company has opened a new production facility.

Fonons
www.fonons.lv

Biosan
www.biosan.lv

Elderly
Daredze Holografija

Biotechical centre
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www.bioreactors.net

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Fonons
www.fonons.lv

Forest Owners Consulting Center
The company uses integrated airborne LiDAR (light detection and ranging) and hyperspectral remote sensing systems for various environmental applications. It is an active remote sensing company with interests high frequency, pulsed laser light to measure the location and 3-D geometry of objects on the ground. Hyperspectral RS is an emerging and complementary technology that captures a nearly continuous reflected shortwave energy spectrum ranging from the visible to shortwave infrared using an airborne imaging spectrometer. Integration of LiDAR and hyperspectral data, therefore, provides both a spatially and spectrally rich data set, with LiDAR contributing a third spatial dimension (height) to the horizontally and spectrally continuous imagery generated by hyperspectral imaging sensors.

ELLAT
ELLAT is an automation and process-control company whose clients are municipalities, municipal companies, and enterprises. The company automates water supply, lighting, and energy supply systems – all that is needed for these important functions for consumers and companies to be performed safely, qualitatively without interruptions, and effectively.

The company has developed solutions based on the widely used SCADA system whose general purposes are control points data acquisition, monitoring and reporting to the operator. These solutions can be used for monitoring production plants, premises, equipment processes – anything where it is possible to connect a controller and take readings.

www.ellat.lv

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www.fonons.lv

Forest Owners Consulting Center
acquisition system for remote monitoring and controlling

Integris has developed finished solutions for medicine, like in an easy way? Simply get out your Palm or cell phone and of small equipment - Pocket PC (PDA) and mobile phones.

A small company that commissions solutions for problems equipment manufacturer.

low-mix medium-volume environments can be found at High-mix medium-volume, medium-mix medium-volume, (Elektromek i Årjäng) and Ventspils, Latvia (Ventspils in the city of Ogre and operating subsidiaries in Sweden Hanzas Elektronika is one of the largest electronic manu-

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facturing services companies in the Baltics, headquartered in the city of Ogle and operating subsidiaries in Sweden (Elektromekan i Årjäng) and Ventspils, Latvia (Ventspils Elektronikas Fabrika).

High-mix medium-volume, medium-mix medium-volume, low-mix medium-volume environments can be found at Hanzas Elektronika – a really wide choice for every original equipment manufacturer.

www.grindex.lv

Grindeks
In Latvia the name Grindeks does not raise any ques-
tion – this is the largest producer and exporter of high value added products in Latvia in terms of volume. In the meantime, it is also the largest pharmaceutical company in the Baltics. Currently Grindeks' products are being manufac-
tured in Estonia, Lithuania, Poland, and in Russia. Grindeks offers more than 100 effective and safe medica-
tions – heart and cardiovascular, psychotropic, anti-cancer agents, CNS drugs, analgesic, cough, and flu medications.

The company is especially proud of its brand products Mil-
dronate® and Posofur®. Grindeks manufactures also active pharmaceutical substances. The company's products are exported to more than 40 countries all over the world.

www.grindex.lv

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facturing services companies in the Baltics, headquartered in the city of Ogle and operating subsidiaries in Sweden (Elektromekan i Årjäng) and Ventspils, Latvia (Ventspils Elektronikas Fabrika). High-mix medium-volume, medium-mix medium-volume, low-mix medium-volume environments can be found at Hanzas Elektronika – a really wide choice for every original equipment manufacturer.

www.he.lv

Integris LLC
A small company that commissions solutions for problems of small equipment - Pocket PC (PDA) and mobile phones. So, if there is a more complicated task, then why not solve it in an easy way? Simply get out your Palm or cell phone and send your cardiogram for today to your doctor, or monitor and control devices in a sky-scaper.

Integris has developed finished solutions for medicine, like Heart Guard personal cardiac monitor, mobile wireless data acquisition system for remote monitoring and controlling various electronic devices, and control solutions for moni-
toring the use of vehicles.

www.integris.lv

Jauda
JSC ‘JAUDA’ was established in 1961. Nowadays it is one of the largest producers of electrical equipment in the Baltic States. From its beginning, ‘JAUDA’ has produced products for energy and electification, including compact substations, low and medium voltage equipment, metal constructions, and metal ware. Compact transformer points are designed to transform voltage from 20 or 10 kV to 0.4 kV and distribute it (also available with metering), with one or two transformers up to 1000 kVA. The substation has an auxiliary switchboard that ensures its own devices’ (lights, sockets, thermo security, etc.) feeding and security with automatic switches and fuse blocks. JSC ‘JAUDA’ produced concrete-base substations are good for installation in cities and close to objects with special aesthetic importance, since they are elegant and, from an architectural point of view, can fit any interior.

www.jauda.com

JZ Microphones
JZ Microphones received the Award ‘Winner of Innovative Product of Latvia 2008’.

www.jzmic.com

Kamri
If there is a bottleneck in your production facility’s con-
voyer process, or there is a large amount of hand work to be done, Kamri is there to solve all such technological problems encountered by producers. The main business direction of the company is design and manufacturing of automatic production equipment for a wide range of industries, beginning with the first layouts to start-up runs of ready machines.

Kamri has customers in Latvia, Estonia, Finland, Sweden, Germany, and the US in the radio electronics and telecom-
munication industry, pharmaceuticals, the automotive industry, and wood processing.

www.kamri.lv

Medicamina
In opposition to producers of synthesised substances there is the company Medicamina which has developed more than 50 preparations from natural substances and is cur-
tently producing for export medicinal products, body-care products, and cosmetic products.

Current production of the company is exported to Russia, Belarus, Estonia, and Canada.

medicamina@edi.lv

Plasma & Ceramic Technologies
Plasma & Ceramic Technologies is a producer of nano-sized powders of refractory compounds (oxides, nitrides, carbonides etc.) and their multi-component composites for the plasma technique. These compounds are applied across a wide range of products such as ceramics of high thermal conductivity, components of fuel cells, implant materials for medicine, everywhere where the properties of ceramics are necessary, and where the use of standard ceramics is impossible.

These nano-powders were mainly used for manufacturing of advanced ceramics. The advantage of the company in the international market is the manufacturing of nano-sized composite powders with a high degree of homogeneity.

www.medicamina.lv

SAF Tehnika
JSC “SAF Tehnika” could be one of the most developed elec-
tronics companies in Latvia, if not the most developed one. JSC “SAF Tehnika” produces telecommunications and data transmission equipment - digital microwave radio systems. The value of the company are the unique products deve-
loped by the company itself, organisation of the company, and its competitiveness on an international scale.

The company began activities in 1999 with 10 employees; however, at present it employs around 160 specialists. The production of the company is exported to more than 60 countries, and the company is competing internationally with such leaders of the telecommunications industry as Nokia, Siemens Network, Ericsson, Alcatel or NEC, despite of their economics of scale.

www.saftehnika.com

Sidrabe
In 2007, the World Intellectual Property Organization (WIPO) awarded golden medals for contribution in the development high technologies to the JSC Sidrabe. This was not accidental or unexpected, if we take into account that Sidrabe is a world-wide known producer of vacuum deposition technologies and equipment. The technologies, equipment and component products produced by the company have been installed in many production plants which produce, for example, flat displays, batteries, archi-
tectural and solar glass, goods for our own consumption where 3D parts metallisation is necessary, and elsewhere.

Almost all production and technologies of the company is exported, with the main export markets being Europe, the USA and Asia.

www.sidrabe.com

SWH SETS
SWH SETS was established in late 2000 as a spin-off from the software development company DAI. The main business area of SWH SETS is software development and maintenance.

The company has developed several interesting solutions for business activity and industry, such as the utility billing system for heat energy consumption, facility management system, leak analyzer for oil products pipelines, smartcard digital signature, an encryption utility, etc. For SWH SETS international competitiveness is not a challenge, as the company successfully exports part of its software to the European market.

www.sets.lv

Z-Light
Z-Light is specialised in the development and production of fibres, fibre bundles, cables, and laser delivery systems for scientific, industrial, and medical applications. The company offers a full range of silica multimode optical fibres with excellent transmission in the UV, VIS, and IR regions.

A question might arise as to what is so special about the production of these fibres as telecommunications cables are earthed for thousands of kilometers? While true, this is only when we speak about standard solutions to problems. In many cases, where there is a specific problem or the solution must be above existing standards, it is necessary to commission the production of these more specialised materials. This is the reason why Z-Light is special and one of the leading companies in the world.

The company produces more than 1000 types of products, including optical fibre products for different optical sensors, laser technology, and medical equipment. The production of the company is mostly exported to Western Europe, Israel, the USA, and Singapore.

www.z-light.com
Material production sector: GroGlass

New glass nano-coatings offer a wide range of applications, yet they must be developed and certain commercial uses must be found. Scientific research is needed which is to be carried out by the company in cooperation with scientific institutes from Latvia, the Netherlands, Germany, and the USA. The potential application of the new products could be in the production of thermal energy-saving glass structures used in architecture, large-screen TV sets, etc.

Solar energy commercialisation has another direction of development, and in this respect the company, together with other sectoral technology leaders of Latvia (PLC Sirdabe, PLC AUFAR RRR, the Institute of Solid State Physics of the University of Latvia), work on the creation of a Baltic Solar Competence Centre to establish in Latvia educational, scientific, and production base for the development of new generation technologies for the global solar energy industry.

www.groglass.com

30MEUR investment as the basis of choice – knowledge of surface coatings

One of the preconditions for a glass melting facility is access to cheap energy sources, whereas the Geoglass production facility needed technical support both for the manufacturing facilities and the coating technology.

Investors of the company (the multinational investment holding NCH Capital Inc.) chose to develop this production facility in Latvia as both components needed for these investments were ensured by specialists in Latvia; the PLC Sirdabe and the Institute of Solid State Physics of the University of Latvia engaged in the production of machinery and technology development (vacuum coatings technologies). As a result of this successful cooperation, the company now has at its disposal a unique vacuum coatings equipment and technological process which allows the manufacture of a globally competitive product.

The total amount of investments in the production facility amounts to 29MEUR, and the forecast turnover of these investments were ensured by specialists in Latvia; Groglass is working on this research. Groglass is an export-oriented production facility, and most of its production is marketed abroad, at present mainly in the Netherlands.

New products and the Baltic Solar Competence Centre

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www.groglass.com

Chemistry sector: Syntagon

The Latvian pharmacy sector is well known to foreign drug manufacturers, and the synthesis of biological active substances is one of the most productive Latvian export commodities with the highest value added. Foreign producers are placing their orders here as well as purchasing the newly-produced active substances in Latvia. The most popular names in relation to synthesis of active substances in Latvia are Grindeks and the Institute of Organic Synthesis.

Syntagon is a Swedish contract research organisation, the services of which is synthetic organic chemistry as well as specialized assistance in analytical chemistry and crystallisation. The name of the company is well known in relation to its organic substance synthesis services.

The first production facility of the company outside Sweden – in Riga

The production facility of the Syntagon company is located in Sodertalje; however, since 2005, the company has had another production facility in Latvia. By using the experiences gained in Latvia in the synthesis of biological active substances, Syntagon has successfully expanded its activities by attracting the local organic chemistry specialists. At present Syntagon is able to perform more orders, since also their quality as per request by international drug manufacturers and other commissioning parties of the industry.

There are 15 regular employees working in the company in Riga (PHS chemistry).

Syntagon Baltic – an independent company with its own clients

Usually a subsidiary performs orders of its parent company in the international market, but this is not the case for Syntagon Baltic; it is a self-sufficient undertaking which has its own customers in the international market. Activities are mainly driven by qualification and ability of its own specialists to perform and arrange orders. The customers of Syntagon Baltic are large international pharmacy undertakings in the EU and the USA, and practically all synthesized substances (85-90%) are exported.

Successful activity – the basis for future investments

The successful activity of the Syntagon company in Riga has convinced its owners regarding the profitability of substantially expanding this production facility. By keeping track of global development of the industry the company waits for an appropriate moment to make new investments and expand the company in Latvia. After making investments, the number of the company’s specialists could reach 30. The planned investments could amount to around 3MEUR, and the annual turnover after such expansion could reach 5.1MEUR for the production facility in Latvia.

www.syntagon.se

Mechanical engineering sector: Baltrotors

Innovation literature mentions as an axiom the ability of the company to respond to the new needs of customers and the development of new products in this direction. The hundred per cent local capital company Baltrotors is an exact example of this axiom.

Palmar joint for industrial technology

The production of Baltrotors company is hydraulic rotators for manipulation technology. More simply - Baltrotors is responsible for the palmar joint, a technology you might have seen, for example, in a forest where a harvester has grasped a tree, and in a few seconds the tree is changed to a log and loaded in a trailer.

This would be a simplified description, as this palmar joint is necessary not only in forest technology, but also for each robotised technology which deals with grasping and further processing of large-size objects. Thus, for example, the rotators of Baltrotors are used in the above-mentioned forest technology, transport industry, and industrial construction, disassembly technology. As regards the construction and disassembly technology, it is the most recent greatest achievement in the development of products and market acquisition in 2007.

Main asset – Constructors office

The exact ability to understand requirements of the industry and the future needs in respect of technology and state of art, Constructors office is the key to success of the company. In the construction of hydraulic rotators requires engineering knowledge is very high; since, during the construction process, the functions of the rotor, loads of different directions and accuracy of hydraulic junctions, and the choice of materials must be taken into account. The combination of all these factors determines the quality and longevity of a rotor.

In its constructor work, the company cooperates with the Latvian State Forest Research Institute “Silava” which, on an experiment basis, tests new products. In 2008, the company has developed 9 new products, thereby proving that the introduction of innovative solutions is the strategy pursued by Baltrotors to reach the leading position in the industry. In the development of new products the company plans to use the EU Structural Funds’ programme ‘Support for Development of New Products and Technologies’.

Successful innovation management results in sales

The success of the company is very well characterised by its investments in innovation and production technologies, and, at the same time, by the increase of its sales volume. The most recent investments account for 3.8MEUR since 2004, while year-on-year sales growth constitutes, on average, 33%. The total sales volume in 2007 was 6.5MEUR in its industry, the company from Latvia has been able to reach the position of second largest player in the world by strengthening its position in the market year by year. At present, the company exports its products to 55 countries in the world.

Total investments account for 29MEUR since 2007, and the forecast turnover of these investments were ensured by specialists in Latvia; Groglass is working on this research. Groglass is an export-oriented production facility, and most of its production is marketed abroad, at present mainly in the Netherlands.

Electricity sector: Real Sound Lab

Innovative product of Latvia 2008 Award

Loadspeaker correction technology – beyond the limit of the usual

At present, it is very interesting to observe the success of Real Sound Lab, as not long ago the products of this company were at the level of ideas and assumptions. The company has introduced a serious revolution in the field of the world’s audio acoustics, and its product, CONEQ, can be bought by any professional or a simple music lover, for whom it is important to reach a better sound with their existing audio systems. This can be achieved in a quick, simple and safe way.

The basis of this story of success is the knowledge of the author of the idea (Raimonds Skuruls) and a private investor’s far-sightedness.
The relation of Hollywood to Coneq
At present in the movie industry sound recording sometimes takes place under the shelter of the film studio; however, with the requirements of the audience increasing, this task of recording and processing of sound is often carried out by specialised record studios which can reach much better results. In Hollywood, the most popular Studio of this type is Mi Casa Studios. If this name does not say anything to you, then one can also mention such names as New Line, MGM, Artisan and Miramax, which are film studios using Mi Casa Studios audio services or, if you prefer movies, then such names as the James Bond series sound remastering and the Lord of Rings would certainly be familiar.

Latvian contribution to the ITER
The University of Latvia scientists (Institute of Physics, Institute of Solid State Physics, Institute of Mathematics and the Faculty of Chemistry) are working on solving several problems, in particular, the use of liquid metals and lithium-containing ceramic materials in a plant, plasma diagnostics, as well as the calculations of high-capacity and high-frequency gyrotrones. The company SIA Hidrovats is developing at present the test batch for an eutectic mixture of a Li-Pb compound to be used as reactor blanket, which will later on supply the nuclear fusion energy reactor. We would mention also that the 13th European Fusion Theory Conference will be held in Riga in 2009.

Energy sector: Fusion energy ITER project
Bringing the power of the Sun to the Earth
Coal, oil, and nuclear fuel were the energy of the 20th century, yet they will not be the 21st century fuels. The new search for energy might be the most important issue that all the countries of the world are concerned about. One of the most challenging projects in this field is ITER, the first prototype of a nuclear fusion energy reactor in Cadarash (FR). This type of reactor includes a range of problems requiring technological solutions, each of which has to be solved by the best specialists of the world.

Could CONEQ become the new standard for the sound correction industry?
In a short period of time CONEQ has managed to gain recognition among approved sector specialists. In the last year’s exhibition, the Real Sound Lab has won the “Par Excellence” Award from the Pro Audio Review at the New York AES Show. In one of the world’s exhibitions, the Real Sound Lab has had the opportunity to meet the guru of audio technologies, the entrepreneur Ray Dolby, who founded “Dolby Laboratories” 40 years ago. He said “Guys, this is incredible that you have done this!” So the answer to the question is very likely.

The ITER device
Source: www.iter.org

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