2011

ACTIVITY REPORT

THE NEW CTI

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA
Commission for Technology and Innovation CTI
Innovation Promotion Agency

“Because we like to think long term, we are conducting three development projects at the same time. This wouldn’t be possible without the CTI.”

PHILIPPE EMMANUEL GRIZE
POSALUX SA

“The success of our CTI project is thanks to the excellent cooperation with our partners in academia.”

FREDDY LEI
CENDRES+MÉTAUX SA0

“Thanks to the CTI project, Swiss producers can be involved in producing primary goods in a growth market.”

JEAN-PAUL KRATTIGER AND PIUS EBERHARD
FENACO

“For us, it was the right money at just the right time.”

MAURO PREVOSTINI
DOLPHIN ENGINEERING

“In my experience, even small companies can carry out CTI projects with success. I can highly recommend these development projects.”

ANNETTE DOUGLAS
ANNETTE DOUGLAS TEXTILES AG

2011 UNDER REVIEW
Looking back on a year of change

01

PART I

CTI reorganisation

President's foreword

WALTER STEINLIN
CTI PRESIDENT

Strong is not always good! This was the year of the strong Swiss franc, worth five times more against the dollar than it was during my first stay in the USA, although admittedly that was several decades ago. This was great news for imports, but disastrous for exports.

In the year under review, we identified our main target group in the light of our revised KTT Support strategy. This group comprises about 10 000 SMEs who are able and willing to translate research-based findings into products or production methods. Nearly all of these companies operate competitively on the global market. These are companies which are unfairly disadvantaged by the strength of the Swiss franc, even though Switzerland has done its economic homework. Comparing innovative activity between countries has become an almost tedious exercise; Switzerland has topped the table for many years now. Youth unemployment, which I see as a key indicator of the health of a country's economy, is hovering at around 4 per cent as I write. That is too high for each of those unemployed young people, but low in comparison with other countries. Now the eurozone is afflicted and many countries are suffering the woes of the financial crisis. Switzerland, with its small, highly developed and globalised economy, is having to pay its solidarity contribution in the form of extreme demand on its healthy currency, which results in huge disadvantages for its production industries. This development in the franc was a huge issue for us in the second half of the year. In response to a suggestion by the head of department, we proposed the introduction of special measures; parliament then approved a special additional funding package worth 100 million Swiss francs, admittedly imposing a very tight time frame. With enormous effort on the part of all those involved we were able to allocate the full amount by the end of the year to appropriate projects, which will likely trigger many times that amount in new investment.

The special measures meant that our newly styled commission was put to the test very soon. Since the beginning of 2011, following the partial revision of the RIPA (Research and Innovation Promotion Act), the CTI (Commission for Technology and Innovation) has been a formal executive commission. Our mandate remains the same but responsibilities have been reapportioned. There is now an elected commission with managerial and decision-making powers, which is represented in important issues by the seven-member Executive Board. The former section at OPET (Federal Office for Professional Education and Technology) now operates as an administrative office, preparing and carrying out business, and is part of the Federal Department of Economic Affairs FDEA. The fact that almost everyone was willing and able to continue to work with the same degree of care and focus under the new structure is testament to considerable conscientiousness and inner strength.

The CTI's main activity is still project funding and on that level we received a baptism of fire in the form of the special measures. The start-up funding programme ran efficiently and very satisfactorily. It experienced a 'soft handover' from Urs Althaus, who developed it and formed strong networks, to Faris Sabeti, who competently took over the successful model and began to carefully revise the partnership system. Meanwhile, the KTT Support strategy revision process was running in the background. Having subsidised networks for the past five years, we now want to concentrate these activities on supporting SMEs, which occupy the weakest position in the innovation system. To do this, we have formed a new commission team. Myriam Meyer, who previously provided her advice from the wings, agreed to become the new head of this section and apply the analysis results. The new strategy will be implemented from the beginning of 2013.

Despite our great satisfaction with what we have achieved, we nonetheless begin the new year with a large degree of respect and self-criticism. We are very much aware of the responsibility we bear in allocating millions of francs of taxpayers' money, and want to hone in on weaknesses and unclarified issues. For example, the separation of CTI funding from private industry innovation funding remains an issue which requires greater transparency. Internal efficiency will also be a key matter to address, so that as little money as possible goes on administrative procedures. I personally feel that it is important to look at and evaluate the long-term effectiveness of the CTI's work; this is an area in which there is still much to be done.

I am proud of the commission members' and administration's professionalism, and of our inspiring mandate to turn research investment into economic value. For what can be more exciting than helping great ideas and great people along the path to success?

WALTER STEINLIN
CTI PRESIDENT

"Four out of ten companies submitted an application to the CTI for the first time."

INTERVIEW WITH DR KLARA SEKANINA

DR KLARA SEKANINA
DIRECTOR, CTI SECRETARIAT

In 2011 the CTI received additional financing. Taking stock at the beginning of 2012, do you think this has been used effectively?
The strong franc placed a strain on margins and so Swiss exporting companies were discouraged from investing in innovative projects. As far back as February 2011 the Federal Council therefore requested parliament to approve additional funds for the CTI of CHF 10 million in both 2011 and 2012. This request was met by parliament in June. The CTI then introduced two measures to encourage companies to innovate. Firstly, the additional funds available meant that the fixed amount companies were required to contribute to promotion projects could be reduced – provided the companies' reduced margins made them eligible to receive these funds. Secondly, the CTI introduced the 'CTI voucher', which makes it easier for SMEs and start-ups to be innovative in Research and Development (R&D). On the basis of a project description submitted by the company, financial support is assured at an early stage. The voucher gives businesses greater control over the development of R&D projects, and the company receives start-up support in realising ideas and, in a second step, in finding a suitable research partner. When greater flexibility was introduced in the middle of the year, companies reacted by submitting a larger number of applications. Both these measures have led to a measurable degree of additional innovation.

Then an additional 100 million franc programme to counteract the effects of the strong franc was launched by the government in autumn 2011. .
That's right; that sparked an amazing innovative spurt. The special measures provided support to R&D projects with a high risk factor or projects designed to reduce the time to market. Forty per cent of all applications were submitted by companies which had never before conducted a project with the CTI.
We also received a lot more applications for regular project funding. Businesses are keen to invest in innovation even in economically difficult times. A hundred million francs was not enough to fund all the projects submitted. Over 500 applications could not even be processed. We are closely monitoring the effects of the special measures to see to what extent the objectives are achieved. As soon as findings from the analyses are available, they will be made public.

How did your experts and secretariat staff cope with the enormous amount of extra work?
Everyone is very motivated and flexible in their work. We received ten times the usual number of applications in the last two months of 2011. In these two months, thirty-four experts meetings were held to carefully check and assess the applications. I should mention that the commission members work for the CTI in addition to their main jobs, so the meetings took place in the evenings, early mornings and at weekends. The secretariat had to employ nine temporary staff immediately, no-one took any holiday and people worked overtime. Everyone was prepared to work incredibly hard.

Some critics said that innovation promotion is not the right way to counteract the effects of the strong franc short term. What do you have to say to them?
It makes sense to support innovative activity, especially when the economy is weak. When companies are doing badly, they feel forced to cut back on investment in R&D. But that is a bad idea for two reasons. Firstly, there is no 'stop and go' in innovation. When workers are made redundant or leave, knowledge is lost forever, and rebuilding that know-how and infrastructure costs money and takes time. Secondly, if there is no innovation promotion in difficult times, there is no investment in the future, and the company's medium- to long-term position in Switzerland is jeopardised. Promotion sees companies through difficult times short term – for instance now, when the franc is so strong – so that Swiss companies do not find themselves at a competitive disadvantage in the future.

The new Ordinance to the Act on Research and Innovation Promotion allows money to be guaranteed at an early stage in a project, making things easier for businesses. Has this change borne fruit?
This measure encourages universities and businesses to share knowledge and technologies. The new legal provisions close a gap in the system of CTI and Swiss National Science Foundation (SNSF) funding. The SNSF funds application-oriented basic research which does not have immediate commercial objectives. The CTI now also supports R&D projects which show huge potential but for which an implementation partner from private industry has not yet been found. This might be the case when such projects take a long time to develop or there are too many uncertainties involved. The CTI supports university R&D projects for up to 18 months, until they have reached a stage of development at which companies can get involved. The new ordinance makes it easier for innovative initiative to flourish on both sides.

How does innovation in Switzerland compare with EU countries and the USA?
According to the Global Innovation Index 2011 by the renowned business graduate school INSEAD, Switzerland is the world champion in innovation. CTI support is just one element of this success. The institutional infrastructure in Switzerland plays a huge role in favouring innovation. The Swiss dual education system is excellent. In our universities we have world-class scientists engaged in research. Institutions such as the universities of applied sciences and the federal research institutes work closely on problems which arise in industry, in particular in SMEs, and play an important role in translating scientific findings into practical applications. But the real drivers of innovation are businesses. Three per cent of our gross domestic product is invested in R&D, and two-thirds of this investment is contributed by private industry. This shows a huge willingness to innovate. Switzerland is a country of small and medium-sized enterprises, often family businesses, which create the majority of jobs and remain in the same location even in difficult economic times. Switzerland has a large number of unknown champions among SMEs, export and supply businesses which enjoy great success on the world markets.

GUEST CONTRIBUTION
Innovation

THOMAS STRAUBHAAR

02

PART II

Destruction and creation go hand in hand

Innovation: the basis of prosperity!

THOMAS STRAUBHAAR

Long-term economic success depends on innovation. The importance of innovation is not just a feature of new growth theory; empirical analysis clearly confirms that innovation is key to the competitiveness of individual companies operating in globalised markets. Innovative solutions make it possible to overcome problems of economic scarcity. This is true in healthcare and energy supply, mobility systems and environment and climate protection. The success of individual companies is the basis of huge growth and employment potential in the economy as a whole. This forms the backbone of a prosperous society.

SENSATIONAL

"In a life-threatening emergency situation, the surgeon moved her scalpel remotely from over 1000 kilometres away, conducting complicated open-heart surgery. The patient was in Zurich, the world-renowned specialist in a high-tech electronic operating theatre in London, where she controlled the precise movements of the robot's instruments in Zurich using modern information and telecommunications technology. This special heart operation, the first of its kind to be conducted in Switzerland, was a great success and the patient has made a full recovery."

This may seem like science fiction to many; you may find it beggars belief or the thought of it simply makes you shudder; but the truth is, conducting operations via the Internet has been possible for some time now. The technology is now available to be widely used in practice, and there are very few areas of diagnostics, therapy or surgery which cannot be performed from a distance of thousands of kilometres. However, there are still considerable issues to overcome – legal liability and insurance issues, financial and social concerns and also the fears and uncertainties of the patients themselves – before this unproblematic technology can be used as a matter of course. It does not bear thinking about what would happen if, during telecardiology, the Internet connection were lost, the image on the screen disappeared or not all the necessary data were transmitted. Of course, nightmare scenarios like this can also occur when a doctor operates directly on a patient in theatre. But in this situation, unlike during an operation via the Internet, it is hopefully easier to respond in an emergency.

If we acknowledge this technological innovation in the field of information and telecommunications, one thing is clear: this is not where progress ends, rather we are only just beginning to discover what new ideas in optical, acoustical and sensory data and signal transmission will be able to do for us in the coming decades. And not only in healthcare. It is also true of the education sector, which is experiencing a rapid increase in e-learning, a further explosion in databases, incredibly fast search engines and clever algorithms which make information accessible even more quickly. It is true of the transport sector, where intelligent routing systems, ecological mobility management, new propulsion technologies and highly flexible combined transport systems are being developed. It also applies to the logistics sector with its new space-saving storage systems and integrated order, booking, financing and insurance processes. It is true of new materials and surfaces, self-healing or self-repairing substances and materials and new artificial intelligence applications. The same applies to the use of versatile mobile devices, virtual 3-D (substitute) worlds and individualised apps in offices, homes and leisure time.

MAKING MORE PEOPLE BETTER OFF

Innovations have one great advantage for us: they expand our opportunities. However, not everyone can benefit from innovations to the same degree; the one who seeks and discovers something which is new and better can benefit from this knowledge sooner. Innovative problem-solving can generate a lot of money. It is the hope of profit and wealth which has inspired many inventions, discoveries and improvements. That hope was held by the Ancient Greeks and Romans, the seafarers of the Middle Ages and the fathers of the Industrial Revolution. It is a hope cherished by those now involved in the search for renewable energy sources, even smaller electronic circuits, faster forms of communication and more effective medicines. Resource scarcity, consumers' willingness to spend, and the high prices and fat profits this generates are some of the factors which clearly signal to businesses and risk-seeking investors that they should invest time and money in looking for new products, clever services, improved processes or advanced organisational procedures. If successful, there is a chance of becoming as rich as the Rothschild brothers, John D. Rockefeller, Jean Paul Getty, Steve Jobs, Larry Page or Bill Gates.

But innovations do not just benefit the successful investor. Innovations set off a chain reaction, at the end of which more people are better off than before. No-one can be excluded from the advances in knowledge that an innovation brings – herein lies the overall economic benefit. Knowledge once gained can be imitated, reproduced and so spread relatively cheaply. It costs millions in research and development to build an aerodynamic aeroplane, create new software or discover an effective vaccination. But it often costs little more than the paper itself, the blank CD or chemicals to copy the plans, programme or drug. In other words,

innovation involves enormous fixed costs, but the marginal costs of imitation are extraordinarily low. Even though inventors and innovators try to ensure by means of industrial secrets and patents that they alone will profit from their invention, they cannot prevent at least part of the associated knowledge from getting out sooner or later and in one form or another. At first, only those in the immediate vicinity will benefit, then a wider circle of people, and finally the whole world. Knowing more about how to overcome life-threatening situations, how to produce food, treat illnesses and close the gaps in supply chains will sooner or later lead to improvements in everyone's lives.

Greater universal prosperity is therefore achieved when a few individuals obtain greater wealth. It is therefore right that innovations should be protected by patent, in order to stimulate entrepreneurial drive. However, there are two sides to patents: they promote innovation but at the same time create artificial monopolies. If innovations are too strictly protected, this creates huge profits for monopolies and has too little effect on improving the prosperity of the general public. If there is too little protection for innovations, investors are not sufficiently encouraged to take on economic risk and help to bring innovations and inventions to market. As a result, the rate of technological progress slows, and society is not able to react as quickly to the challenges of modern life as it is in an environment of rapid innovative change.

A POLICY OF RESTRAINT

If greater innovation leads to greater prosperity and an improved standard of living for everyone, this begs the question as to how society can increase the pace of innovation. Since no-one can know who will have the next brilliant idea, nor when or where, innovations cannot be prescribed, ordered or produced at will. Of course, the state can be innovative in individual cases. But a sober analysis of a socialist system in practice shows us clearly that although the Soviet Union was the first nation to send a satellite into space, the Soviets were unable to keep up with the pace of innovation at which the open, democratic nations of the capitalist West were progressing, not just in individual instances but across the board, where an idea in one area led to a new one in another field. Dynamism and breadth are able to release an avalanche of innovation which sparks an increase in economic productivity and growth. This is where state-planned economies are left behind, as they simply do not have the same information networknetwork as exists in market economies as a result of the permanent, free interaction between people who are constantly selling, buying or exchanging goods, services and above all, ideas. Barring individual instances, an organ of state is simply unable to bring together such an unbelievable wealth of information and put it to innovative use, and above all to cope with the astounding speed at which facts are learned, decisions are made and action is taken.

Innovation is the driving force behind structural change. It leads to both destruction and creation. Thus policies which encourage rather than hinder structural change provide fertile ground for innovation. They should espouse Friedrich Hayek's maxim that competition is a discovery procedure and reject any claim by the state to a monopoly on knowledge. Incentives should be created so that all kinds of people, whether they find themselves in a backyard or garage, in a lab or an office, feel it is in their own best interests to grasp the initiative and search for new ideas, ideas which, with some help from risk-taking investors, will not only bring them personal recognition, but earn them money too.

BENEFITS FOR LATER GENERATIONS

A restrained innovation policy necessarily creates a climate which views the new as an opportunity rather than as a threat to the old. It removes barriers to entering and leaving the market, including for (foreign) workers. It necessarily generates a social milieu in which thinkers, inventors and founders feel at ease. In short, economic policy which is based on freedom and self-responsibility, is governed by regulatory rather than procedural politics, and which understands that change and openness are key to long-term success, is automatically good innovation policy. It stimulates technological and organisational progress, boosts economic growth and so lays the foundations for an increase in general prosperity.

However, there is a further thing which is true of a restrained innovation policy: innovations are the result of research and development, and of education and training, and unfortunately returns on investment in R&D often lie far in the future. This means that later generations are often the first to enjoy the fruits of today's labours. But there is some good news. The higher the level of knowledge we accumulate today, the more new knowledge will be generated from this existing knowledge at a later date. Investment in education unleashes an endogenous, self-reinforcing innovation process. The education system therefore lays the foundations for future prosperity and growth. Innovation costs a lot, for both the individual and a nation's economy. But lack of innovation costs more!

PROF. THOMAS STRAUBHAAR
GUEST AUTHOR

Thomas Straubhaar is Head of the Hamburg Institute of International Economics (Hamburgisches WeltWirtschaftsInstitut, HWWI) and Professor of Economics at the University of Hamburg, with a special interest in economic policy. Since 1998 he has been Director of the Institute for Integration Research (Institut für Integrationsforschung) at the Europa-Kolleg, Hamburg. Thomas Straubhaar graduated in economics from the University of Bern and went on to do a PhD and receive a professorship at the same institution. Following a series of teaching posts at the universities of Constance, Basel and Freiburg, in 1992 he was appointed Professor of Economics at the Helmut-Schmidt University, Hamburg.

PORTRAIT

The federal agency promotes knowledge-based innovation based on the principle of subsidiarity

03

PART III

The CTI: efficient and effective

The Commission for Technology and Innovation CTI is the federal agency for the promotion of knowledge-based innovation in Swiss businesses. Experts employed as part-time commission members, coaches and the secretariat staff all contribute to promoting the success of Switzerland's economy. Since 1 January 2011, the CTI has been an autonomous body with its own regulatory statutes.

Publicly funded research and innovation promotion in Switzerland is largely the responsibility of two institutions, the Swiss National Science Foundation (SNSF) and the CTI. Whereas the SNSF is responsible for promoting investigator-driven research, the CTI supports innovation in industry and thus plays a key role in the state's economic policy. The activities of the SNSF and CTI complement each other.

MISSION:

TURNING FINDINGS INTO ECONOMIC SUCCESS

The CTI is mandated to fund and provide consulting services for knowledge-based innovation in Switzerland in order to promote the Swiss economy.

CTI funding activities concentrate on the stages in the value-added chain between basic research and market launch (see diagram). There are a range of coordinated services which constitute the promotion activities. These are designed to strengthen the Swiss economy long term, by increasing the competitiveness of Swiss private industry, in particular SMEs, and improving the efficiency and effectiveness of organisations which serve the general public. These include hospitals and educational establishments, for example.

The main beneficiaries of this system are implementation partners in industry. The CTI promotes a company's innovative activity which meets a market need and promises to be successful economically. It draws the attention of businesses to its services and supports business initiative.

The secondary beneficiaries are research partners, who receive funding for efficiency and long-term development. In this the CTI applies the push-principle, encouraging and enabling scientists to turn new findings into commercially viable products and services.

Investment in research and universities can bring good returns when science and industry work closely together. The CTI promotes knowledge and technology transfer (KTT), helping to turn ideas in the laboratory into products on the market, encourages 'innovation leaders' in start-ups and improves the environment in which young entrepreneurs operate.

Funding is granted according to the principle of subsidiarity, when innovation has come to a standstill or market potential would remain unexploited without the help of the CTI, for instance when the risk is considered too high by private investors, but the CTI experts believe that the product has the possibility to succeed.

PROJECT, START-UP AND KNOWLEDGE TRANSFER PROMOTION

The CTI differentiates between three areas of promotion. CTI R&D promotion helps science-based innovation to achieve a breakthrough by financing research and development projects which are carried out jointly by companies and universities. The market relevance of these projects is a significant criterion in the CTI's decision to grant funds. The projects are carried out by companies, public sponsors and in some cases, non-profit organisations working with public research institutes. The CTI will even support highly risky but promising projects, feasibility studies and pilot installations.

In the CTI 'Start-up and entrepreneurship' programme, potential entrepreneurs can learn about setting up and growing a business. The CTI provides coaches to support young and innovative companies in particular tasks. It runs training courses for young people who show potential for setting up an innovative business and its start-up programme helps companies to become established. 86 per cent of new companies with the sought-after 'CTI Start-up' label are still in business after five years. CTI start-ups have created more than 3700 jobs since 1996.

KTT Support is the CTI programme for encouraging the transfer of knowledge and technology so that innovative projects and ideas for start-ups have a chance of getting off the ground. The CTI creates an opportunity for businesses to interact, providing information platforms, advisors and promoting a range of selected national networks. The CTI is also involved in international research and innovation promotion.

MANAGEMENT OF THE CTI SECRETARIAT

ERICH BLOCH
RESOURCE MANAGEMENT

KLARA SEKANINA
DIRECTOR

DANIELA MEIER
START-UP AND ENTREPRENEURSHIP

ANDREAS REUTER
PROJECT FUNDING + KTT

CTI PARTNERSHIPS

The CTI's main partners are research institutes and specialist KTT consortiums. International networking is becoming more dynamic, and so the importance of maintaining links to international sources of innovation, funding and markets is growing. Along with the SNSF, the CTI's network of partners includes Euresearch, institutions coordinated under ERA-NET and national funding agencies in other countries. The CTI has a strong partner in the Swiss Federal Institute of Intellectual Property when protecting the intellectual property rights of innovators.

Last but not least, the CTI's work requires close links between offices within and outside the Federal Department of Economic Affairs FDEA. Of particular importance are the links in the FDEA to the Federal Office for Professional Education and Technology OPET and the State Secretariat for Economic Affairs SECO, and in the Federal Department of Home Affairs FDHA to the State Secretariat for Education and Research SER.

CTI ORGANISATION

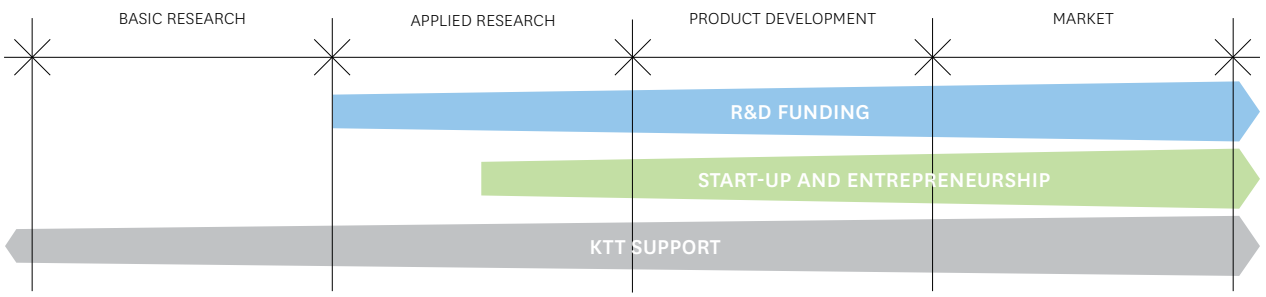
The CTI is a slimline, efficient and effective organisation. The commission members are experts selected by the Federal Council on the basis of their skills and experience in industry and research, who work for the Commission on a part-time basis assessing and supporting innovation projects. The Commission is headed by the CTI Executive Board; strategic decisions are made in consultation with the CTI Director. The 55 commission members decide on grant applications in their specialist areas and on funding awarded to research institutes or as part of KTT Support.

In addition, there are 55 coaches mandated to support the development of selected new businesses.

The CTI is headed by a president, who sits on the Executive Board along with six elected experts. The members of the board are in charge of six areas of funding. These form the structure within which the experts and coaches providing CTI services operate (see diagram).

22 staff work at the CTI Secretariat, which deals with administrative business and prepares the decisions made by the Executive Board and funding areas. It plays a vital role in preparing and supporting the work of the Commission and Executive Board.

CTI INSTRUMENTS IN THE INNOVATION CHAIN



THE CTI IN SWISS LAW

The work of the Commission for Technology and Innovation (CTI) is based on Art. 64 (Research) of the Federal Constitution: "The Confederation shall promote scientific research and innovation." The CTI acts as the Confederation's innovation promotion agency. The Research and Innovation Promotion Act (RIPA) and the corresponding ordinance (RIPO) describe the tasks and their implementation. With the anchoring of the CTI in the RIPA in 2011, it was officially detached from the Federal Office for Professional Education and Technology (OPET). Since 1 January 2011 the CTI has been taking decisions as an independent executive commission with an affiliated secretariat. It is attached to the Federal Department of Economic Affairs (FDEA) for administrative purposes.

In the last revision of the RIPA, research promotion was extended to include innovation and so as to combine the Confederation's research and innovation policies into an integral approach. The new RIPA sets out the Confederation's support for scientific research and science-based innovation and reduces overlaps. In innovation research, research bodies pay specific attention to competitiveness, value and job creation in Switzerland.

In 2010 the Confederation defined its international strategy in the area of education, research and innovation (ERI) in the ERI dispatch and set corresponding goals for the following years. As a basis for the ERI dispatch period, the CTI presents a multi-year programme to parliament and the Federal Council every four years setting out its budget requirements. This ensures that public finances are used in the manner intended by lawmakers and that promotion efforts are coordinated. The multi-year programme for the period 2013–2016 can be downloaded from the CTI website (www.kti.admin.ch).

REPORTING

Including the CTI compensatory measures, 225 million francs worth of funding was approved in 2011.

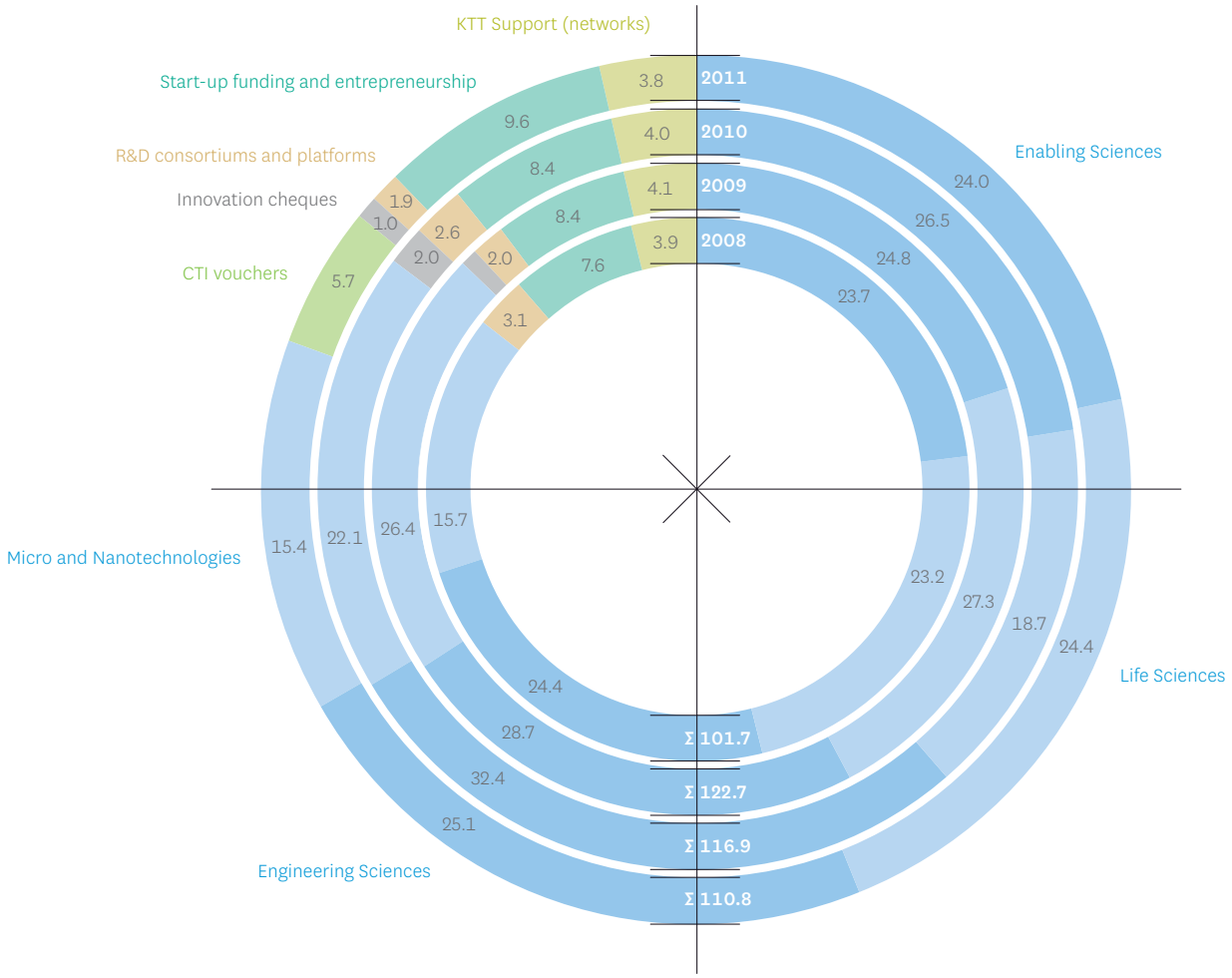
04

PART IV

246 additional R&D projects approved under compensatory measures

*Regular CTI funding**

2008 TO 2011



FEDERAL FUNDING IN CHF M

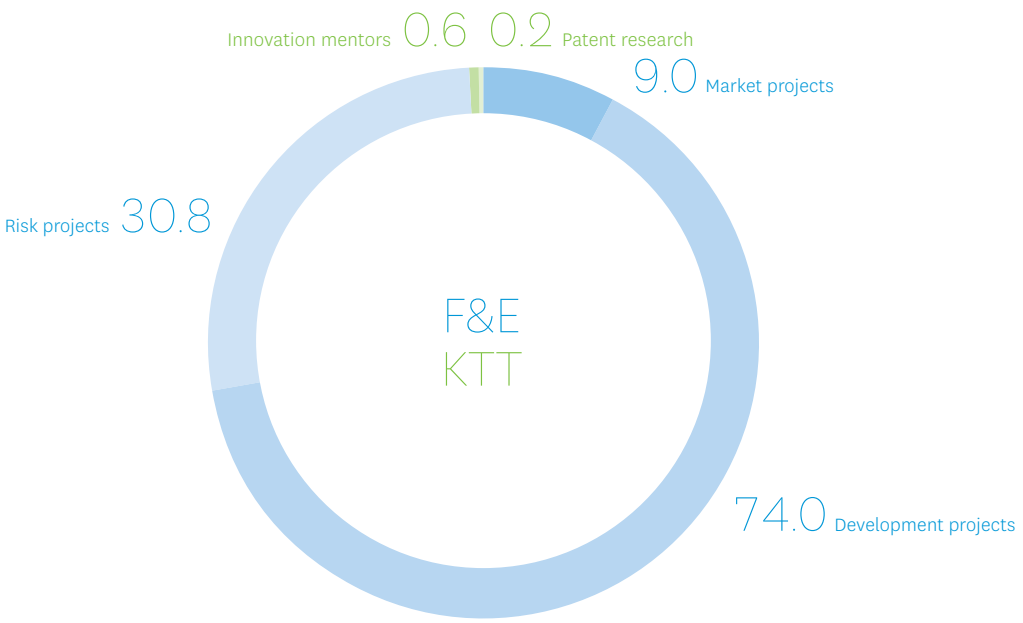
2011: 110.8

CTI vouchers were added to the range of funding instruments in 2011.
Funding is slightly below the level of the previous year.

* Amount allocated.
2011: incl. CHF 10 m to make funding criteria more flexible (Federal Council decree of 22 June 2011).
2009: incl. CHF 21.5 m from 2009 stabilisation programme.
Rounding differences may occur

Special measures

"STRONG FRANC" 2011



FEDERAL FUNDING IN CHF M*

114.5

*The additional funds were mainly used to support R&D projects in order to reduce the "time to market" of innovative products.***

* Amount allocated; rounding differences may occur.

** Within the framework of the compensatory measures (October – December 2011) companies receive support, a) to implement new knowledge more quickly in products related to development projects, b) to bring innovation projects more quickly onto the market (for a and b, max. 18-month duration) and c) to pursue high-risk projects that had been shelved due to the economic situation and erosion of margins (max. 36-month duration).

R&D FUNDING

1110 R&D projects were assessed in 2011

04.1

R&D received funding of 208 million Swiss francs

R&D PROJECT FUNDING 2011

WITHOUT 'STRONG FRANC' SPECIAL MEASURES*

	Number	%	Project costs CHF m	Federal funding CHF m	Funding from industry CHF m
PROJECT FUNDING					
Funding applications considered and federal funding applied for	520			171.7	
Projects approved	293				
*of which reserves, pending***	82				
Approval rate, projects		56			
Aborted projects	3	1			
*Expenditure | funding for approved projects**			204.7	88.9	115.8
*of which reserves, pending***	82		65.5	29.0	36.5
Approval rate, federal funding		52			
Participating companies (approved projects)	599				
Participating SMEs > 250 employees (approved projects)	443				
Participating corporations > 250 employees (approved projects)	156				
Proportion of participating companies SMEs		74			
FURTHER R&D FUNDING MEASURES					
CTI vouchers assessed and federal funding applied for	45			14.4	
Approved CTI vouchers	17		12.8	5.7	7.2
*of which reserves, pending***	14		11.2	4.9	6.3
Approval rate, CTI vouchers		38			
No. innovation cheques assessed and funding applied for	215			1.6	
No. innovation cheques approved and federal funding	133			1.0	
Approval rate, innovation cheques		62			

Around three-fifths of the entire project costs are borne by business partners.

* Amount allocated.

** In principle, approved R&D projects or CTI vouchers with outstanding preliminary work; generally written agreement between research and business partners on the regulation of ownership, and for CTI vouchers also the substantive preliminary work until final approval.

R&D PROJECT FUNDING 2011

2011 R&D PROJECT FUNDING 'STRONG FRANC' SPECIAL MEASURES*

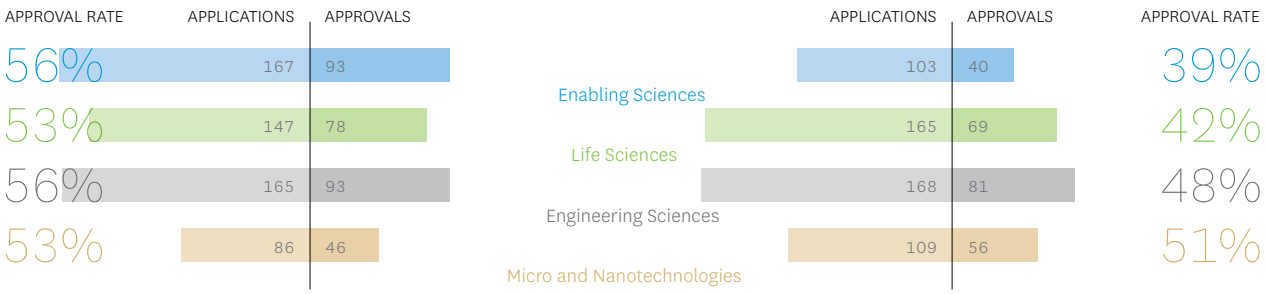
	Number	%	Project costs CHF m	Federal funding CHF m	Funding from industry CHF m
PROJECT FUNDING					
Funding applications received and federal funding applied for	1064			532.3	
Funding applications assessed and federal funding applied for	545			298.6	
Approved projects	246				
Approval rate, projects		45			
Aborted projects	1				
Expenditure | funding for approved projects			237.8	113.7	124.1
Approval rate federal funding		38			
Participating companies (approved projects)	342				
Participating SMEs > 250 employees (approved projects)	241				
Participating corporations > 250 employees (approved projects)	101				
Proportion of participating companies SMEs		71			
APPROVED PROJECTS BY SPECIAL MEASURE					
Approved market projects	23		16.4	9.0	7.4
Approval rate		42			
Approved development projects	174		161.8	74.0	87.8
Approval rate		48			
Approved venture projects	49		59.6	30.8	28.9
Approval rate		39			

Under the special measures against the strong franc, 1064 projects were submitted within a few weeks.

*Amount allocated.

Applications and approvals 2011

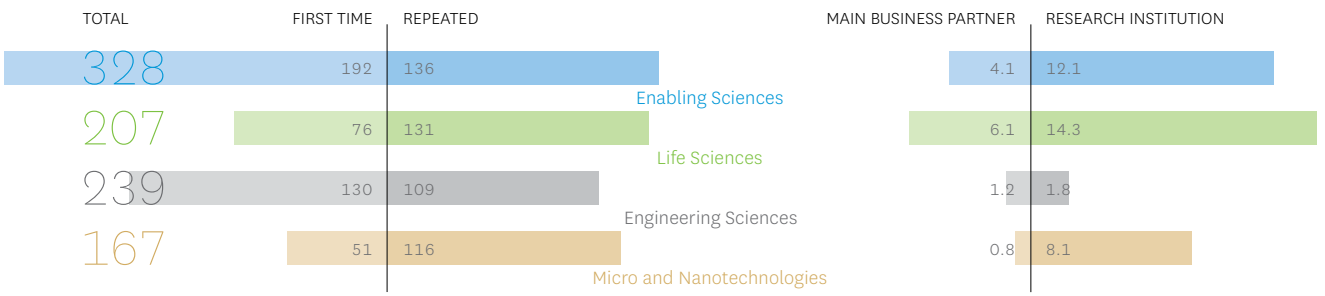
REGULAR R&D PROJECT FUNDING AND SPECIAL MEASURES 2011



R&D projects are assessed on the basis of the following criteria: market implementation, innovation potential and scientific content. The approval rate in terms of the special measures is significantly lower.

Companies involved

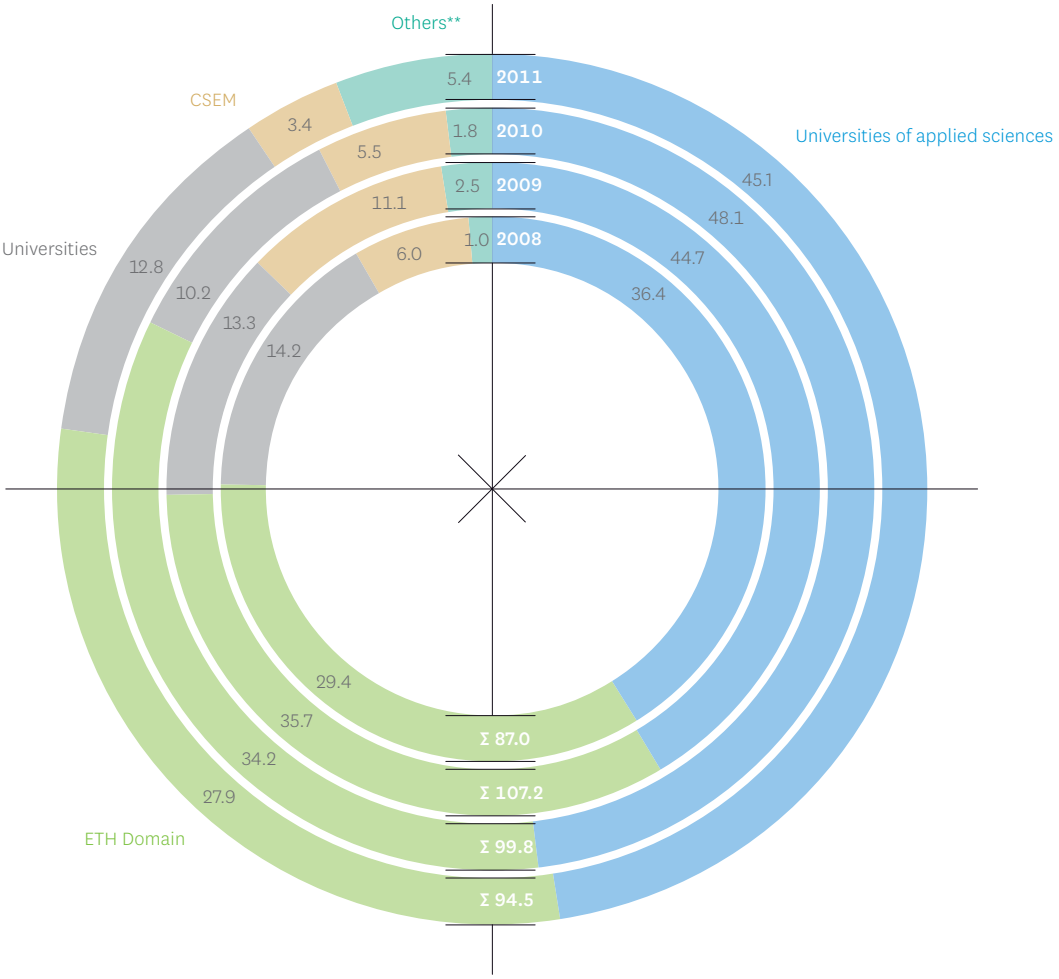
REGULAR R&D PROJECT FUNDING AND SPECIAL MEASURES 2011



Almost five out of ten companies completed a regular CTI project for the first time (left-hand chart).

Federal funding by research institute

REGULAR R&D PROJECT FUNDING 2008 TO 2011*



CHF m*

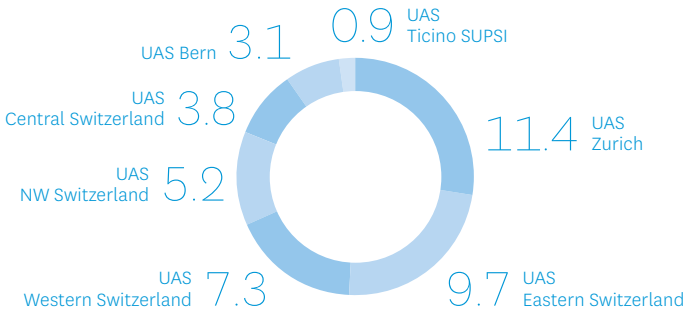
2011: 94.5

In 2011, 47% of the regular R&D funding flowed to universities of applied sciences, 29% to the ETH Domain and 14% to universities.

* Amount allocated, 2011 including CTI vouchers; rounding differences may occur.
** In the case of CTI vouchers, some projects still lack a research partner.

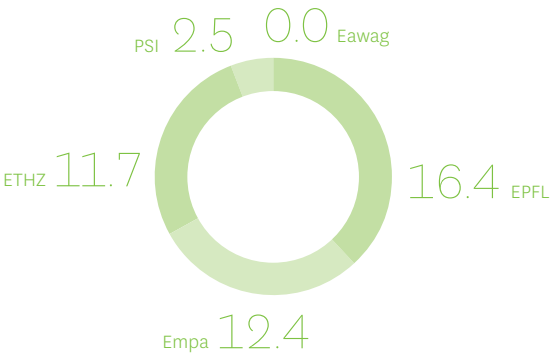
Federal funding for special R&D grants

2011 R&D PROJECT FUNDING BY INDIVIDUAL RESEARCH INSTITUTES IN CHF m



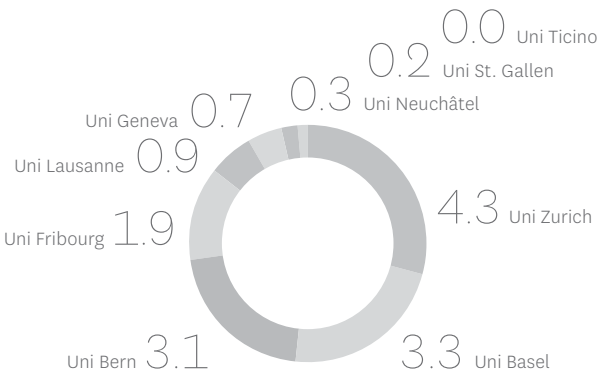
UNIVERSITIES OF APPLIED SCIENCES

41.4



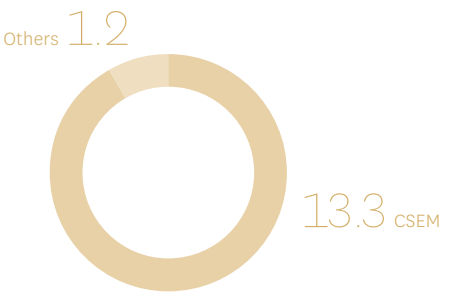
ETH DOMAIN

43.0



UNIVERSITIES

14.8



CSEM AND OTHERS

14.5

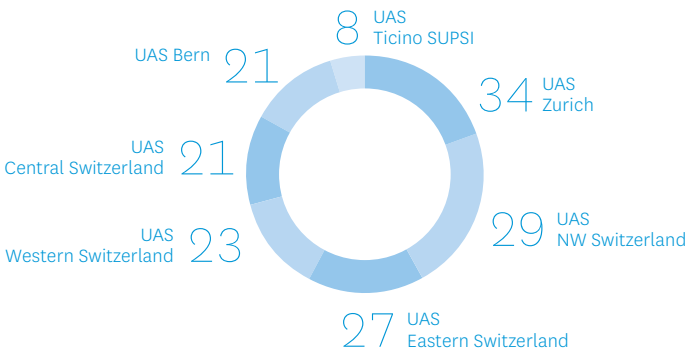
113.7*

On average, R&D projects supported as part of the special measures are awarded a grant of 462 000 Swiss francs.

* Amount allocated

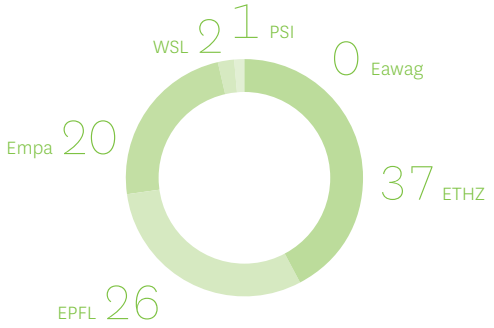
Number of approved projects

2011 R&D PROJECT FUNDING BY INDIVIDUAL RESEARCH INSTITUTES



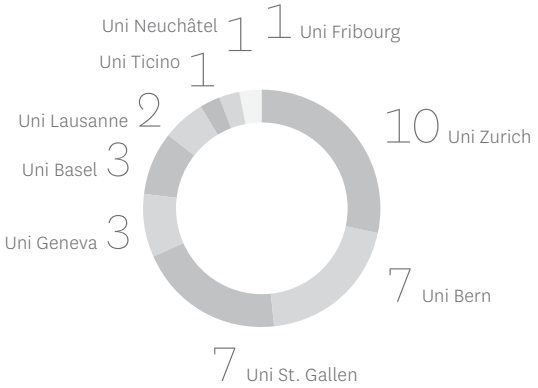
UNIVERSITIES OF APPLIED SCIENCES

163



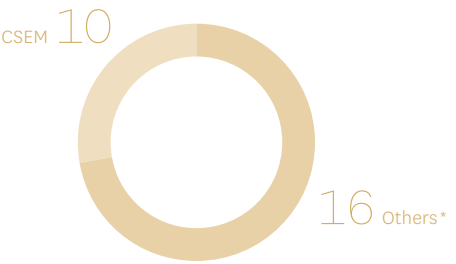
ETH DOMAIN

86



UNIVERSITIES

35



CSEM AND OTHERS

26

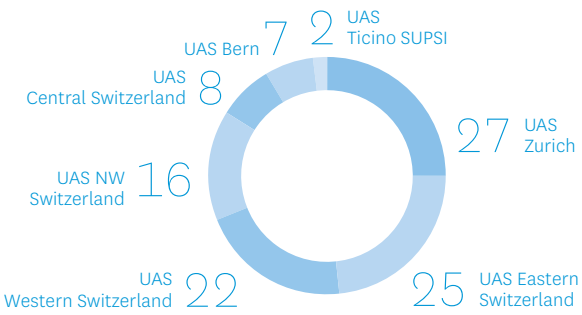
310

Most of the approved projects come from the ETH Zurich and the universities of applied sciences.

* Research partners not yet defined for some CTI vouchers.

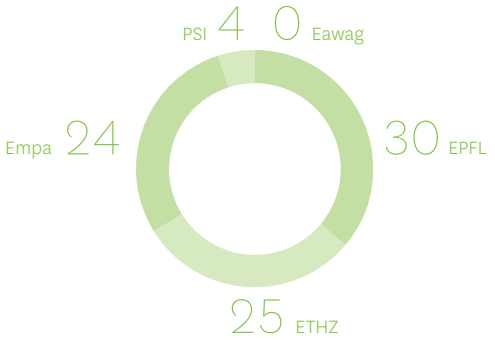
Number of projects approved for special grants

2011 R&D PROJECT FUNDING BASED ON RESEARCH INSTITUTES



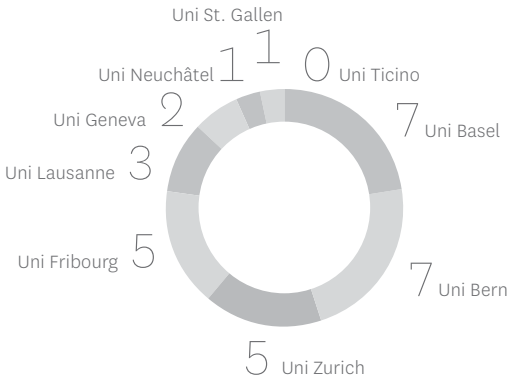
UNIVERSITIES OF APPLIED SCIENCES

107



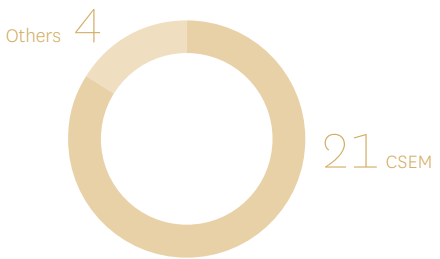
ETH DOMAIN

83



UNIVERSITIES

31



CSEM AND OTHERS

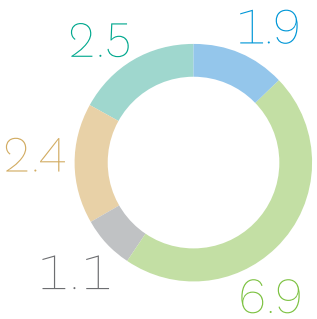
25

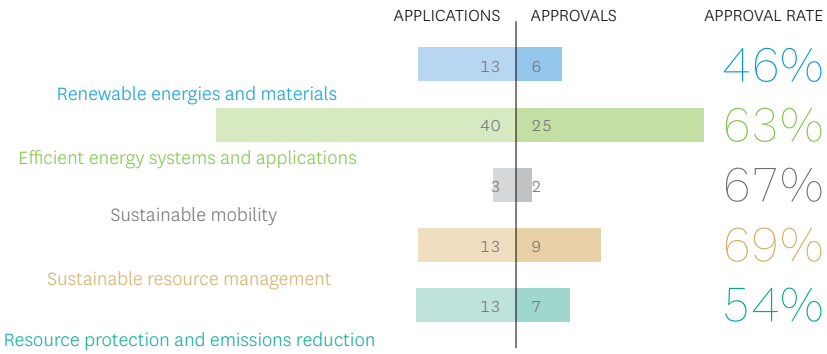
246

The distribution of projects shows a trend similar to that of regular funding: universities of applied sciences rank ahead of the ETH Domain, which in turn ranks ahead of the universities.

Cleantech

R&D PROJECT FUNDING 2011

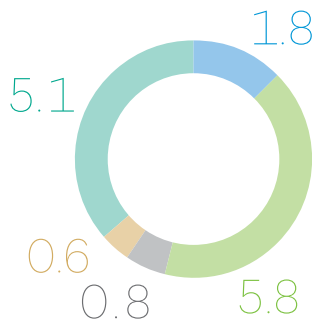


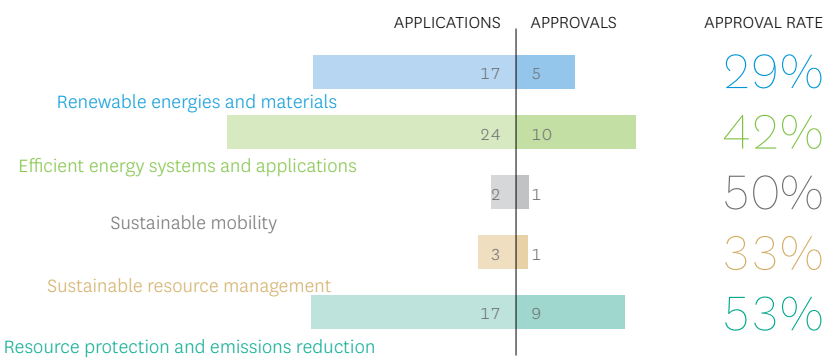


Regular projects
FEDERAL FUNDING IN CHF M*
14.8

Regular projects
NUMBER
82 49 60%

Cleantech's share in terms of federal funding for R&D promotion is around 16% of regular funding and 13% of special funding.





Special measures
FEDERAL FUNDING IN CHF M*
14.2

Special measures
NUMBER
63 26 41%

Around half of the approved cleantech projects have addressed the more efficient production and use of energy.

*Amount allocated.

Applications received

R&D PROJECT FUNDING FROM 2008 – 2011

No. regular applications 2011

591

No. applications: special measures 2011

1064

Special programmes have led to a sharp increase in the number of applications received in the second half of 2009 and in the last quarter of 2011.

04.**1.1**
Enabling Sciences

DR MARTIN MÜLLER
Vice President, Enabling Sciences

Martin Müller is the owner of m2c GmbH (innovation consulting) and sits on the board of BERNINA International AG. Until 2010 he was vice president of Global Innovation at Bucyrus, a company producing machines and systems for mining engineering. Prior to this he was CTO and head of Ammann Group's Technology Centre in Langenthal and held managerial positions at Soudronic and Gretag. Martin Müller studied physics at the University of Basel and has a doctorate in experimental physics of condensed material. He has been a CTI expert since 1997 and head of the Enabling Sciences funding area since 2011.

ICT project submissions are still the most popular and demonstrate the most continuity. The second six months of the year were the busiest for the CTI experts, even without the extra work connected with the special compensatory measures.

THE TRENDS

The largest number of innovation projects are still in the field of Information and Communication Technologies (ICT). They mainly involve new software developments for applications in a huge range of sectors, from architecture and engineering to railways. Multidisciplinary projects are often the most promising. For example, at BrickDesign, architects and software engineers from ETH Zurich joined forces with a Swiss brick manufacturer and began a follow-up research project into robot-assisted construction. The product, a plug-in for CAD programmes, gives architects and engineers new design opportunities.

Numerous projects deal with interaction and collaboration via the Internet (Web 2.0). One example is the market platform 'schnappundweg.eu', which hopes to provide a match for its competitors outside of Europe, eBay & Co., by offering simplicity and innovative functions. The developers at the Zurich University of Applied Sciences have already moved on from the beta version to an official release.

The quality of the projects continues to improve. This is in part due to the increasing experience of the applicants, but also thanks to the support given by committed CTI members. The projects approved included several which had been resubmitted having been reviewed and revised.

INNOVATION AWARDS

In 2011 the CTI once again gave its support to the Swiss ICT Award, both financially and by providing two experts on the jury. It used the event as an opportunity to bring young talent into contact with experienced companies. This year the first prize in the 'Enterprise Champion' category was won by Noser Engineering, a company which has enjoyed CTI support in the past.

Two of the four projects nominated for the Swiss Design Award 2011 in the Research category were CTI projects. One of these was called Optimum, which stands for 'Optical microstructuring and metallisation'. This technical and design concept changes the appearance of textiles depending on the way light falls on them.

ECONOMIC BENEFITS

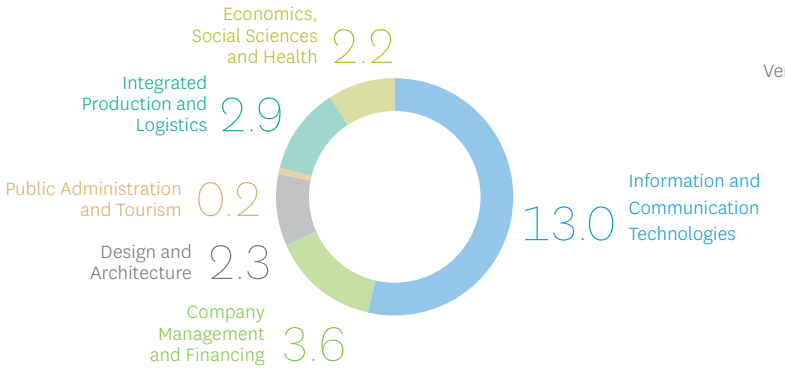
Innovations create unique characteristics in saturated markets. The decorative design in the Optimum project described above, for example, is a unique characteristic in the Swiss textile processing industry. The process also has potential in helping to protect products and brands from counterfeiting, which causes huge financial losses in the luxury goods industry throughout the world. The first Optimum products are already in use. The project is being run by the Kompetenzzentrum Produkt & Textil (Competence Centre for Products & Textiles) at the Lucerne University of Applied Sciences and Arts (HSLU) and is an excellent example of how several research and industrial partners can work together.

It is often evident from the application or implementation plan not only whether an idea is good, but also whether it will sell well. LiberoVision had one such idea. The ETH Zurich spin-off has already sold its 3D analysis tool for sports programmes to TV companies all around the world. At the last football World Cup it was used in front of a huge audience. Since 2011 sports fans in Norway and Canada can also enjoy 3D analyses. Yet despite this success the company did not stop there. In 2011 it submitted a new project a new project to the CTI to extend the product with further innovative features. Since 2011 LiberoVision has formed part of a European group of companies.

Great emphasis is placed nowadays on research into energy. Answers to economic questions are just as important as those to technical questions – for instance, how to distribute electricity efficiently. A consortium headed by ABILITA AG in collaboration with SAP Switzerland and the University of St. Gallen is looking into how the 'meter-to-cash' process can be standardised to help meet the challenges posed by the liberalisation of the market in the Swiss energy industry.

ENABLING SCIENCES

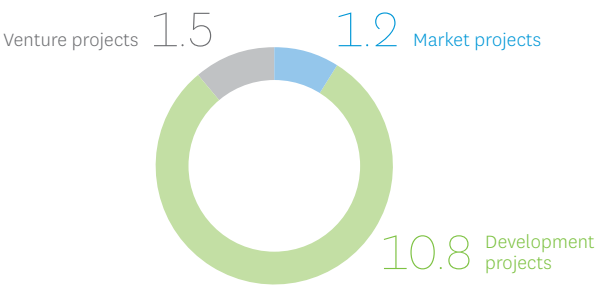
2011 IN FIGURES



Regular funding including vouchers

FEDERAL FUNDING IN CHF m*

24.3



Special measures

FEDERAL FUNDING IN CHF m*

13.5

More than half of the grant funding flows to information and communication technologies.

Regular funding including vouchers

APPLICATIONS AND APPROVALS

56% 167 93

Special measures

APPLICATIONS AND APPROVALS

103 40 39%

The overall approval rate for Enabling Sciences is 49%.
The rate is lower for special measures applications than for regular applications.

*Amount allocated.

ENABLING SCIENCES: SUCCESS STORY

FLEXIBLE WOOD – NEW FREE SHAPING PROCESS

During his course in Industrial Design at the Zurich University of the Arts, Christian Kuhn set himself the challenge of shaping hard wooden panels three-dimensionally. With the help of the CTI, he came up with dukta, a cutting process which can shape panels in any direction. This is a technology which can be applied in many areas, for instance in furniture making and interiors, where there is a need for special aesthetic and acoustic qualities.

This success story begins at the Zurich University of the Arts, where student Christian Kuhn worked with his tutor Serge Lunin, a trained joiner, on a cutting process intended to make stiff wooden panels more flexible in all dimensions. A panel can be made flexible by cutting a slit along the side, but this only makes it bendable along one axis. In the dukta project, the two experimenters took this approach and developed it further. Incisions are made at staggered intervals along two sides of the wooden panel, meaning it can be bent and twisted in almost any direction. In contrast to current processes, this also allows much larger pieces of material to be used and shaped. The processes used up until now worked with pre-cast moulds used to shape wooden panels into three-dimensional objects; thin layers of wood are laid in the moulds and then glued to the object. Alternatively, pressure and steam are applied to change the cell structure of the wood. This means that the wood is made pliable, but once it has taken on a new shape, this can no longer be changed.

POTENTIAL FOR A CTI PROJECT

When Ralf Michel, deputy head of the Research Institute for Design and Technology, heard about this idea, he immediately recognised the potential for a CTI project. Strict criteria must be met before the funding agency will give its support to a project; for example, the project must show economic potential. dukta met this requirement and so the designers, of whom there were now three, went in search of a suitable business partner with sufficient technical know-how, whom they found in the carpentry firm Schneider in Pratteln.

Andreas Schneider, manager of the carpentry business, recalls the early stages: "The first shapes were made by hand. Then a process for making the incisions using industrial machines was developed." The company has already completed several interiors and has put in tenders for some other building projects. Developing the necessary tools took a lot of time. But Schneider believes it was worth the effort: "dukta is a multi-purpose product. The original idea was more aesthetic, but we soon realised that dukta elements have excellent acoustic properties." The incision process creates a surface which is highly sound-absorbent. The company is currently working on a project involving the use of these wooden surfaces in a concert hall.

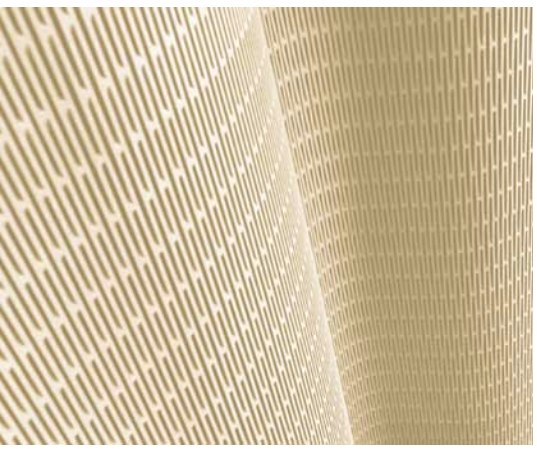
CONTINUING DEVELOPMENTS

dukta is likely to be able to establish itself firmly on the market in the higher and middle price segments. But there is still work to do. As Ralf Michel explains: "Becoming established on the market is part of the innovation process. This requires assertiveness on the part of industrial partners, dealing with companies trying to copy the product, and developing the product." Kuhn and Lunin have already founded dukta GmbH and work closely with the Schneider carpentry company. Both are looking for new customers and continue to work on new product solutions. Schneider is the only producer of dukta elements. The product has already been patented in Switzerland and in Europe. The pioneers hope to build up a company based on dukta products and services. Michel believes that selling services is a particularly good option, as the planning of free-form interiors involves considerable resources.

NOMINATED FOR SWISS DESIGN AWARD

However, first of all it remains to be seen how the market reacts. The response to the first projects was promising. A nomination for the Swiss Design Award, which is presented every two years, is a good sign that the product has potential. dukta was among 34 projects shortlisted from over 300 submissions in the Research category, which awards projects for excellent innovative methods and findings.

Andreas Schneider explains that some individual clients have shown an interest in special furniture made from dukta. But the main demand is principally in interiors.



The incisions can now be cut on industrial machines.

Opposing incisions in the wooden panels make them pliable and twistable.

dukta surfaces have excellent acoustic properties and so are suitable for use in concert halls.

04.**1.2**
Life Sciences

PROF. DR BEDA STADLER
VICE PRESIDENT, LIFE SCIENCES

Beda Stadler is the Director of the University Institute of Immunology of the University of Bern. He lectures and conducts research at the Faculty of Medicine in the field of laboratory medicine, and is a member of the editorial board of several international publications. He is actively involved in foundations and the scientific community, where he is an advisor at Internutrition, which is an initiative of the chemicals and pharmaceuticals industry to promote public dialogue on biotechnology and genetic engineering. Beda Stadler has been a CTI member since 2001, and head of the Life Sciences funding area since 2003.

The life sciences scene reacts extremely flexibly to available grant funding. This was very evident in the middle of the year when the 'innovation voucher' pilot projectwas launched. The news about additional grant funding has meanwhile been attracting the right applicants.

TRENDS

In the year under review, the awarding of vouchers (see page 6) and the special measures have had a positive impact on the innovation landscape. The vouchers alone led to a significant increase in applications and more initiatives from industry. The quality of the applications remains high. Before the increased grant funding, numerous projects were classified as "approved but not funded". The CTI can now increasingly respond positively to these applications.

In addition to the activities in the established medtech and biotech fields, the CTI has noted an increase in applications from the fields of food technology and agriculture, and a revival in chemistry in research topics. Neurotechnology is an emerging discipline in which researchers seek ways to enhance cognitive abilities in humans using synthetic substances.

The universities of applied sciences are catching up: life sciences are no longer the exclusive domain of the FITs and universities, even though the CTI assessments remain equally strict. At the same time, the reputation of applied research is growing in the life sciences field. Most start-up companies, however, continue to originate from universities, the ETH and the EPFL.

ECONOMIC BENEFITS

The Swiss economy not only benefits from the new companies and new jobs, but also from the research projects themselves, such as the research project comparing the effectiveness of various painkillers. The revised Ordinance to the Research and Innovation Promotion Act (see page 6) also allows the CTI from this year on to fund projects, the beneficiaries of which are not individual business partners, but, as in this particular case, the Swiss healthcare system.

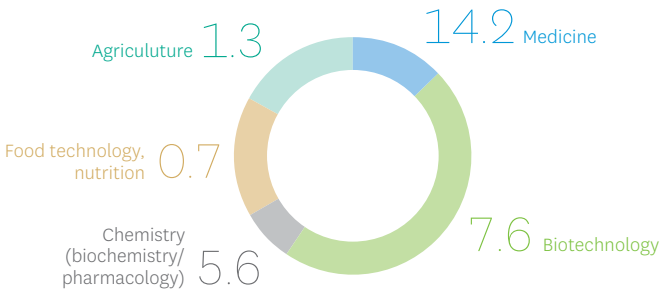
Another positive aspect of the new ordinance is that projects may be funded at an increasingly early stage, when there is still little commercial interest. This is particularly important in life sciences where innovators need to have staying power. CTI experts are often the first people to identify promising projects. Initiatives that can hold their own as start-up companies in the economy create jobs in Switzerland. Without funding many bright ideas are sold abroad before they can be developed in Switzerland.

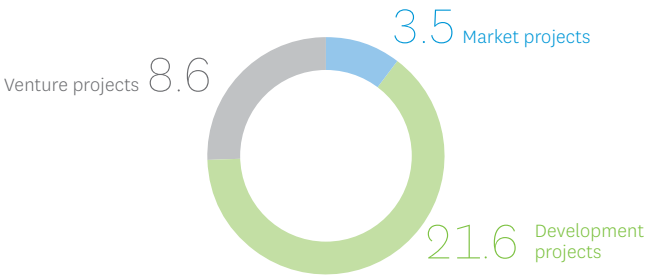
Anergis SA in Lausanne, a company that develops active agents for the treatment of allergies, has remained loyal to Switzerland as a business location. It has so far invested 3 million Swiss francs of its own resources and federal funding. Its initial success resulted in funding in 2011 from long-term private investors, who invested an additional 18 million Swiss francs for developing the products in Switzerland.

A further indicator of the success of innovation promotion is the development of regional concentrations of companies, also known as clusters. In the past, for example, innovations mainly originated from information and communication technologies (ICT) in Zurich. In the meantime, life science companies have established themselves on a former industrial site in Schlieren and now employ almost as many people as the former elevator and wagon factory.

The canton of Jura, which is mainly known for watchmaking, is in a similar situation to Zurich. The 100 or so participants from industry and research who attended the med-tech conference in Délément in October were proof that a new industry could soon be established in the Jura. The CTI supports this development plan.

LIFE SCIENCES
2011 IN FIGURES





Regular funding including vouchers

FEDERAL FUNDING IN CHF m*/**

29.3

OF WHICH MEDTECH

12.9

Special measures

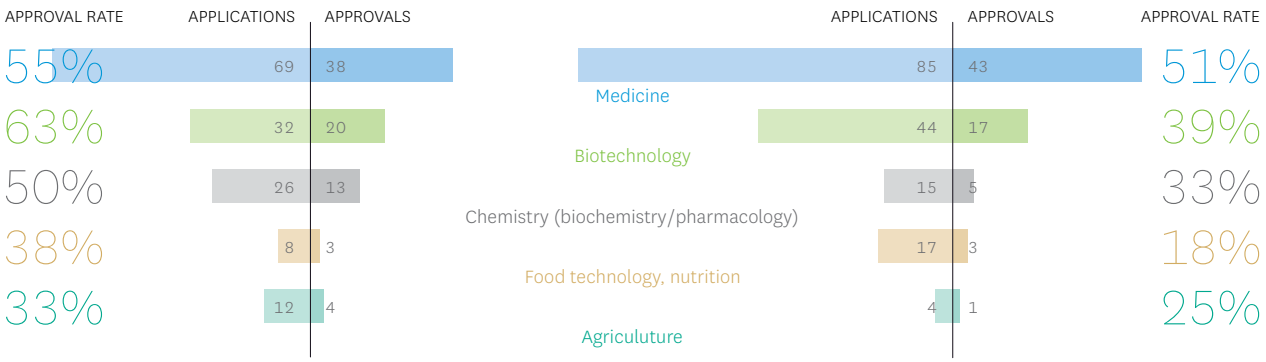
FEDERAL FUNDING IN CHF m*

33.6

OF WHICH MEDTECH

18.8

Medical science and biotechnology are the disciplines most supported in life sciences.



Regular funding including vouchers

APPLICATIONS AND APPROVALS

53% 147 78

OF WHICH MEDTECH

60% 58 35

Special measures

APPLICATIONS AND APPROVALS

165 69 42%

OF WHICH MEDTECH

80 40 50%

Around 50% of the approved projects are in medtech.

* Amount allocated.

** The subsidies for regular funding, include subsidies for CTI vouchers amounting to around 4.9 million Swiss francs.

LIFE SCIENCES: SUCCESS STORY

LOW PRICED ALTERNATIVE TO ANTIBODIES

DARPins, which were developed by the biotech company Molecular Partners, are an innovative and cost-efficient alternative to antibodies. In 2011, the company succeeded in licensing a first product to a major partner.

In the summer of 2011, the US healthcare group Allergan paid over 45 million US dollars for a licence agreement with Molecular Partners from Schlieren. Molecular Partners, which is a biotech company created as a spin-off from the University of Zurich in 2004, licensed its first product, the protein MP0112 that will be used to treat retinal diseases. Until Allergan's new drug is launched on the market, Molecular Partners may receive an additional 375 million US dollars in licensing revenue. MP0112 are a new class of binding proteins called DARPins (Designed Ankyrin Repeat Proteins). They were developed by Molecular Partners from ankyrins, which are proteins that are naturally present in the body.

GREAT POTENTIAL AT MINIMAL EXPENSE

In simplified terms, DARPins are a smaller and cheaper alternative to antibodies that currently rank among the most successful, but also the most expensive medications. In the same way as antibodies, every DARPin binds to a specific target protein. DARPins, however, have a simpler composition compared to antibodies, and can be produced in bacterial cultures instead of animal cells, and this is a considerable cost advantage. Therapeutic products based on DARPins could therefore be a competitive alternative to antibodies in the future, and could, in addition to ophthalmology, also be used primarily in cancer treatment or immunology.

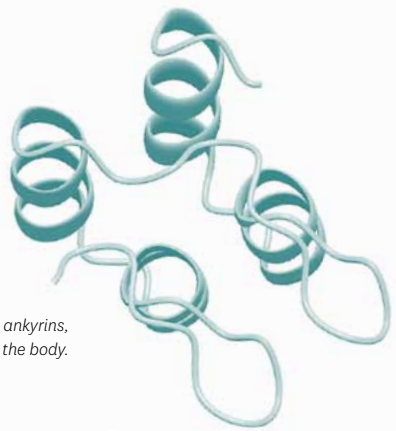
FROM UNIVERSITY TO THE MARKET

The CTI supported the project from a very early stage as part of the first Discovery Project, which means there was no participation from business partners. Co-founder Christian Zahnd, who worked as a research assistant at the Department of Biochemistry at the University of Zurich, and is now CEO, recalls: "It is thanks to the grant from the CTI and to our own financial resources that we were able to begin with assessing the economic potential of this new technology without having to sell product licenses to investors early on." As a result the start-up company won a number of important awards and brought additional know-how into the company with international external experts. In 2007 and 2009, the company raised several million francs from prominent investors in two rounds of financing. "After carefully assessing the situation, we picked the right moment to go for it," explained Zahnd.

NEW PRODUCTS IN THE PIPELINE

Molecular Partners now has around 50 employees. The company favours partnering. "We focus on developing our own products," says Zahnd. Intellectual property rights and all patents remain with Molecular Partners at the University of Zurich. Production and marketing, on the other hand, are for the most part handled together with major licensees. Zahnd goes on to say, "The range of potential DARPin products is huge, which is why we do not only develop our own products, but also give selected partners limited access to our technology."

A product developed by Molecular Partners is expected to treat retinal diseases.



Molecular Partners develops DARPins from ankyrins, which are proteins that are naturally present in the body.

LIFE SCIENCES: SUCCESS STORY

SWISS COOKING OIL PRODUCED FROM A NEW FORM OF RAPESEED

The oil produced from the new form of rapeseed called 'HOLL' can be heated easily and safely and could therefore soon largely replace the hardened rapeseed oil that contains harmful trans fatty acids. This oil is also beneficial for Swiss agriculture and oilseed processors.

Rapeseed oil is considered to be one of the healthiest oils, primarily owing to its high content of 3-fold unsaturated linolenic acid. When heated, however, this fatty acid is destroyed and unhealthy chemical compounds are formed. Rapeseed oil is partially industrially hardened so that it can still be used for frying. But even then unhealthy substances, known as trans fatty acids, are formed. This is why other oils, such as palm oil, are often used for frying instead of hardened rapeseed oil. The import of palm oil, however, leaves Swiss agriculture empty handed and results in the loss of rainforests in oil palm growing regions. This has created a dilemma. Various market partners from the oilseed industry began looking for alternatives more than ten years ago. The result is HOLL rapeseed.

OLEIC ACID INSTEAD OF LINOLENIC ACID

The breakthrough was achieved between 2004 and 2008 in a research project supported by the CTI involving a number of market partners: Agroscope Changins-Wädenswil and Reckenholz-Tänikon research stations, fenaco Genossenschaft, vegetable oil refineries Florin and Sabo, the seed producer Monsanto, the Swiss trade organisation Swiss Granum and the French National Institute for Agricultural Research (INRA). In contrast to traditional rapeseed oil, the oil from this new GMO-free rapeseed contains less linolenic acid and more oleic acid, hence the product's name "HOLL", which stands for: high oleic, low linoleic. Since oleic acid is considerably more heat resistant than linolenic acid, the HOLL rapeseed oil can also be used for frying. It is used in the restaurant and food industry, and is also increasingly available in retail stores. This led to a decrease in the consumption of trans fatty acids in Switzerland by 30 per cent between 2003 and 2009.

OPENING OF A NEW MARKET SEGMENT

"The results exceeded our expectations", says Pius Eberhard, who is responsible for raw foodstuff products at fenaco. "We succeeded in opening an entirely new market segment and in creating a financially attractive export market." The new rapeseed led to an increase in the total cultivated area for rapeseed of 5700 hectares between 2003 and 2010. For the 2012 crop HOLL rapeseed varieties already account for around a quarter of the area sown. Since 2004, HOLL rapeseed has generated nearly 50 million Swiss francs in additional revenue across the entire value-added chain – and this at a cost of only one million francs.

STRENGTHENING AGRICULTURE

Project partners have been exceptionally quick to transform research findings into marketable products. This has largely been aided by greater nutritional awareness in society. "However, the willingness of innovative partners in the entire value chain to pull together and focus on economic success right from the beginning was also decisive", explains Eberhard. Christian Florin, CEO of Florin AG, confirms this: "The research project contributed significantly towards maintaining and developing Swiss oilseed crop production and processing."

In the future, the partners intend to reduce further the linolenic acid content in rapeseed and increase the crop area. The aim is to make it possible for Switzerland to completely abandon the use of hardened rapeseed oil in the future.

Production of HOLL rapeseed oil at the Florin oil processing plant.

In contrast to traditional rapeseed oil, HOLL rapeseed oil contains less linolenic acid and more oleic acid.

04.**1.3**
Engineering Sciences

DR FELIX BAGDASARJANZ
VICE PRESIDENT, ENGINEERING SCIENCES

In his capacity as independent corporate consultant, Dr Felix Bagdasarjanz is co-owner of s b-partner ag. He is chairman of the board of LEM Holding SA in Geneva and a board member of Schneeberger Holding AG in Roggwil. For over ten years Felix Bagdasarjanz held overall management roles at various international companies including as CEO of ESEC, management board member at Unaxis and ABB Switzerland. After serving as head of the Engineering Sciences funding area for ten years, Felix Bagdasarjanz is stepping down on. He is succeeded by Martin Riediker, former head of technology and management board member at Ciba AG and longstanding CTI expert.

In 2011, the vast majority of R&D projects in engineering sciences again originated from the engineering and electrical industry, the construction industry, the process industries and the chemical and physical transformation of materials. The variety of projects is a reflection of the activities in Swiss industry.

THE TRENDS

Most of the applications in the funding area of Engineering Sciences are for projects in the traditional engineering, electrical and metal industries. The innovation landscape of this funding area is undergoing gradual change while showing clear trends.

The most popular projects seen in the applications propose the development of new materials, including projects involving reinforced synthetic material replacing a natural raw material such as metal, or the creation of innovative building materials. An increasing number of applications deal with the generation and use of energy. The University of Applied Sciences of Eastern Switzerland, for example, launched a project in 2011 to develop a product promoting the combined production of photovoltaic and thermal solar energy (PV/T). Researchers at the School of Engineering and Architecture of the Lucerne University of Applied Sciences and Arts submitted a project to the CTI on the development of an environmentally friendly emergency drive for trolley buses.

The majority of applicants are from the universities of applied science and the Federal Institutes of Technology in Zurich and Lausanne. In 2011, the CTI also dealt with a project from the Institute of Geological Sciences of the University of Bern. The project lays the foundation for large-scale fragmenting of solid material. The spectrum of applications ranges from recycling and the building industry to medical technology. The CTI has also supported research involving rockfall protection netting, which underwent a spectacular test and set a new world record at the rockfall protection netting test facility in Walenstadt in 2011 (wsl.ch, 10.10.2011).

ECONOMIC BENEFITS

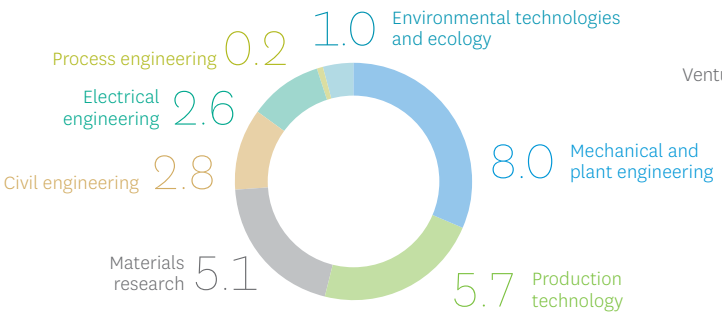
Solutions for improving energy efficiency have worldwide market potential. As such, the new solar panels mentioned above ideally complement the range of products of the business partner, a subsidiary of the Meyer Burger Group. The product's increased economic viability for owners and operators of solar installations gives the manufacturer a competitive edge in an as yet underdeveloped hybrid market.

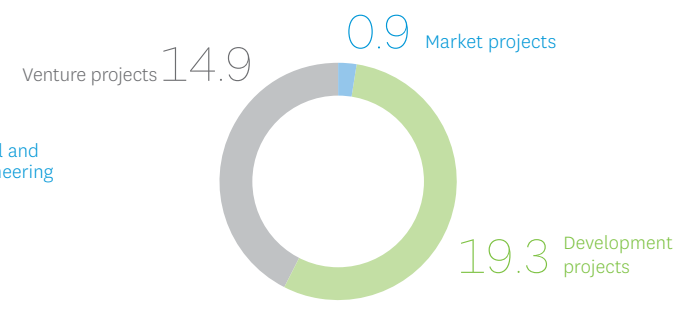
After conducting a feasibility study, an institute of the EPF Lausanne launched a project in 2011 that helps reduce manufacturing costs for photovoltaic systems. The aim is to move the solar industry closer to grid parity, i.e. to adjust the price of solar power produced by end consumers to the price they pay for purchased power. For the project's business partner, an SME, improving the product constitutes a competitive advantage. The success of the project also promotes awareness and use of renewable energy.

Companies in emerging industries benefit just as much as traditional family businesses. The 'Energy Pack' for trolley buses will replace the current emergency generators equipped with combustion engines. The business partner, a vehicle manufacturer from the canton of Solothurn – which has been family owned for five generations, with 250 employees – reckons the clever combination of energy storage devices, power electronics and energy management will give the company a good chance of success in an international growth market.

ENGINEERING SCIENCES

2011 IN FIGURES





Regular funding including vouchers

FEDERAL FUNDING IN CHF m*/**

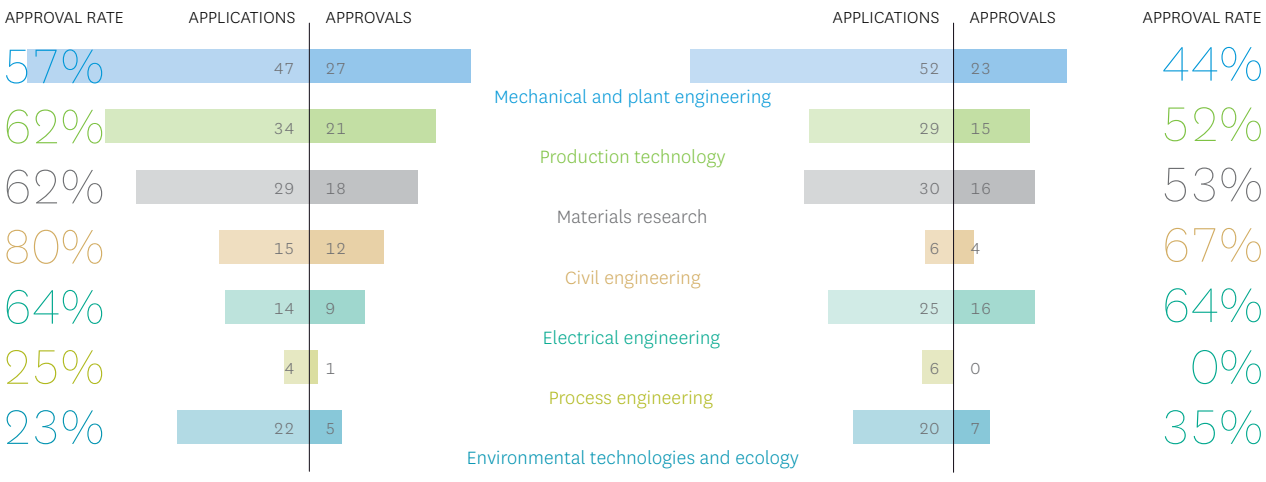
25.5

Special measures

FEDERAL FUNDING IN CHF m*

35.0

High risk projects account for an above average proportion of the special measures



Regular funding including vouchers

APPLICATIONS AND APPROVALS

56% 165 93

Special measures

APPLICATIONS AND APPROVALS

168 81 48%

The approval rate for regular R&D projects at 56% is well above that for special measures at 48%.

* Amount allocated.

** The subsidies for regular funding include subsidies for CTI vouchers amounting to around CHF 0.4 million.

ENGINEERING SCIENCES: SUCCESS STORY

BENEFITS FOR SMEs

In addition to supporting start-up companies, the CTI also supports established businesses. It encourages innovations aimed at delivering improvements in quality and productivity, thus giving companies a competitive advantage in a highly competitive market. Two examples – one from the steelmaking industry and the other from the machine tool industry - illustrate the CTI's approach.

SMS Concast, a leading manufacturer of long product steel making technologies based in Zurich, simplifies the processes in steelworks using intelligent software. The company supplies heavy machinery and the related technology for manufacturing long steel products to all areas of the world, also known as ingots and billets. These blanks are subsequently shaped into semi-finished parts through rolling or forging. The decisive quality criterion is traceability throughout the process chain, which is possible using an image recognition system, now common in the industry, but not easy to apply in the harsh industrial environment of steel production.

There are various methods methods for identifying a billet. Instead of looking for labels and barcodes, SMS Concast focuses on stamped serial numbers. Marcel Meier, head of Development & Technology at SMS Concast explains why: "Our customers work in the high-end segment and we want to guarantee high recognition rates, even if the product is stored outdoors, corroded or covered with snow."

The challenge lies in the automatic readout of the stamped serial numbers. Billets have a square cross-section and are several metres long. The stamp is located on the front of the billet which is not always perfectly smooth. When a billet is brought to the rolling mill after interim storage, the front of the billet is photographed and read out from the system.

OPTICAL CHARACTER RECOGNITION

For this task, SMS Concast uses image recognition software that was developed by the Swiss Centre for Electronics and Microtechnology (CSEM), and that is capable of recognising fonts from photographs. To achieve the required recognition rate, the software must access an extensive library with comparison images of the individual characters. Entering these images is a time-consuming process. "Each character requires around 2000 images and the elements seen on each image need to be entered manually," states David Hasler of CSEM.

The CSEM worked together with SMS Concast in a CTI project to develop a self-learning system in which only a small number of images have to be entered manually. The system checks each image that needs to be verified against the database and decides by itself whether or not it is sure certain that the character was properly recognised. During the system's one-week learning period there are only a few cases where the operator needs to add data by hand when the system requests manual verification. "With this system, far less time is required to create an efficient and user-friendly database," says Hasler.

However, the time saved in creating the database is just one of the advantages. Marcel Meier says: "The new system is capable of recognising characters in all positions. Characters can be at an angle or upside down on a rounded surface and still be recognised automatically." SMS Concast has therefore improved on its existing technology and at the same time expanded its portfolio. The new system has already been put into productive use.

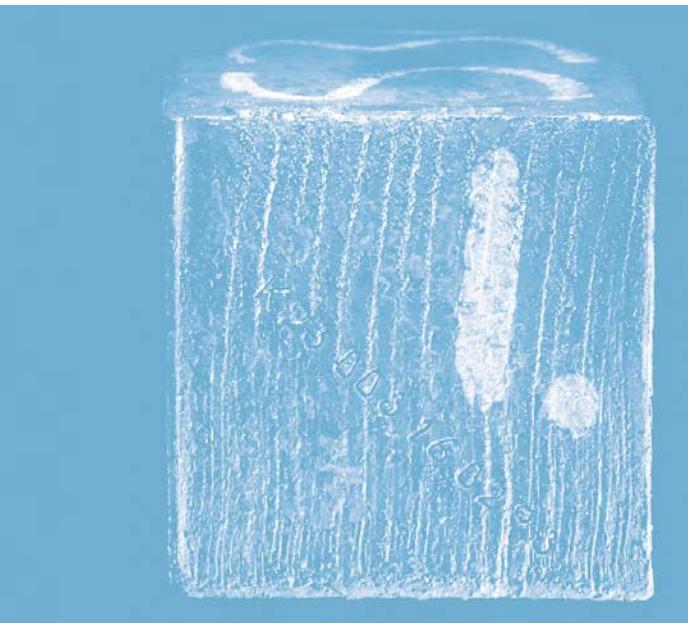
ULTRASOUND SPEEDS UP THE DRILLING PROCESS

Another CTI project helped the Swiss machine manufacturer Posalux SA achieve a decisive competitive advantage. The company produces eroding machines capable of drilling tiny holes in hardened steel. Its cooperation with the EPF Lausanne resulted in an auxiliary module that can be used with electric discharge machines to cut drilling times. This is an important step for components suppliers, considering that fuel injectors for automobile engines are manufactured using this process.

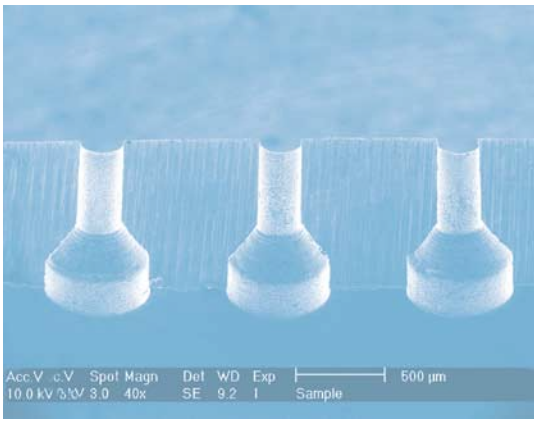
The size and number of fuel injector holes are the main factors that determine the level of exhaust emissions produced by motor vehicles. Cars, for instance, have fuel injector holes that are 110µm in diameter. In comparison, the average human hair is between 50 and 70µm thick. New EU directives now stipulate 90µm-diameter hole sizes for fuel injectors, which increases the number of holes that can be drilled into each fuel injector nozzle. This makes motor vehicles more fuel-efficient and reduces exhaust emissions. It is, however, more difficult to drill smaller and larger numbers of holes on the same surface area efficiently.

.

When a billet is brought to the rolling mill after interim storage, the front of the billet is photographed so that the system can read the stamped serial numbers.



The harsh industrial environment of steel production placed high demands on the image recognition system.



Fuel injector holes need to be smaller than ever and drilled into complex shapes.

RESPONSE TO INCREASINGLY DEMANDING SPECIFICATIONS

With CTI backing, EPFL specialists worked with Posalux to develop a system to reduce drilling times by up to 35 per cent. This is achieved by equipping EDMs with ultrasound, which cuts EDM drilling time down from 30 to 20 seconds per hole. The EPFL's Mechanical Systems Design Laboratory had already been experimenting with ultrasound systems for many years. In Posalux, researchers found an ideal industrial partner who could help them to make their technology suitable for manufacturing purposes. The ultrasound system was built into a module that could be retrofitted to existing EDMs. Posalux is thereby responding to customer demand and serving this niche market. Fuel injectors are the only components where specifications are so exacting.

The entire development process from project commencement to integration of the ultrasound system took only two years. Posalux has overcome major obstacles in the process. Nevertheless, development work continues. "Over the next few years, fuel injector holes will need to be drilled to diameters of 70 µm and be cone shaped," explains Grize. "This can only be achieved with an EDM or a short-pulse laser that doesn't heat up the material. However, pico or femto lasers are simply not powerful enough to penetrate 1 mm-thick material. So we expect to continue using EDM procedures for at least another five years."

04.**1.4**
Micro and nanotechnologies

PROF. DR MARTINA HIRAYAMA
VICE PRESIDENT, MICRO AND NANOTECHNOLOGIES

Martina Hirayama is Director of the School of Engineering and member of the Executive Board at the Zurich University of Applied Sciences (ZHAW). She previously developed and headed the Institute of Materials and Process Engineering at the ZHAW, where she has worked as a research scientist and lecturer since 2004. Her specialist area is polymer nanolayers and nanocomposites, a subdiscipline of polymer materials, a subject field which she has developed at the ZHAW. Before that, Martina Hirayama was interim head of the 'Polymers on Surfaces' group at the ETH Zurich and co-founder and CEO of Global Surface AG, an ETH spin-off. Having studied Chemistry at the ETH Zurich, Martina Hirayama went on to do a PhD in Polymers at the same institution. She also has an MAS in Management, Technology and Economics. She has been a member of the CTI since 2007 and has co-headed the funding area along with Raymond Zehringer since 2009.

As in the previous year, most applications involve projects on optoelectronics, photonics and laser technology. Applied research is increasingly developing promising projects on using energy more efficiently.

TRENDS AND EVENTS

At the beginning of 2011 the CTI also experienced a marked reduction in the number of applications in micro and nanotechnologies, as a lack of funds had meant it had not been possible to consider a lot of good projects the previous year. From the middle of the year, the number of applications increased. The main focus was still on optoelectronics, photonics and laser technology, a field which deals with the interface between electricity and light and in which micro-electrical components in particular are developed. There were also applications in the fields of sensors and actuators for control technology.

In 2011, applicants were primarily universities of applied sciences (UAS) followed by institutions in the ETH Domain.

Energy-related topics are becoming more popular. For example, because ever larger amounts of electrical energy are required to run computers in data processing centres, in future computers will be cooled on-site to avoid the need for air-conditioning. The EPFL and IBM have worked together to develop prototypes and test the efficiency of systems for cooling microprocessors. The results can be expected to lead to massive energy savings in data processing centres.

Nanomaterials is also a rapidly expanding research field. CTI statistics first identified this as a separate science two years ago. It is a science in which nanoparticles are used to coat surfaces and textiles, and in electronics, medicine, chemical analysis or the production of consumer goods such as cosmetics and foodstuffs.

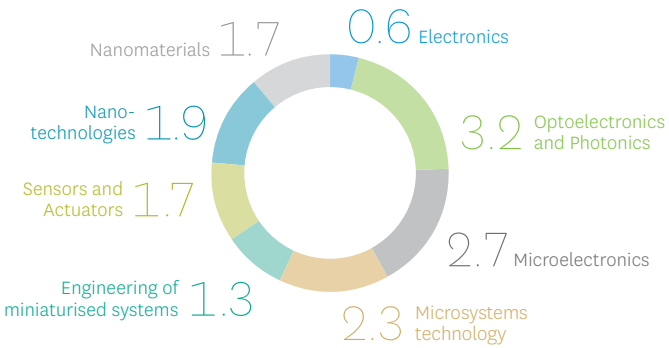
At the Swiss NanoConvention in Baden in spring 2011, which was attended by leading figures from industry and the field of innovation and technology, the CTI organised its traditional MNT Event with an open forum to which representatives from related disciplines were also invited. The guest companies presented a wide range of implemented projects and so demonstrated the success of the CTI's promotion programme.

ECONOMIC BENEFITS

The projects funded often concentrate on very small things, although they themselves tend to be large – and so are the benefits. Translating an innovative idea into an industrial-sized product requires large project teams and considerable material and infrastructure costs. For example, a new cost-saving process for making thermoelectric generators is currently being developed at the ETH. Thermoelectric generators work in the opposite way to a fridge, generating electricity from heat rather than cold from electricity. This means that waste heat can be used to generate electricity, e.g. in cars, which therefore means that fuel savings can be made. The producer greenTEG in Zurich is a first-class start-up company, which employs a team of about a dozen staff.

Micro and nanotechnologies help to solve urgent environmental problems. For example, drinking water in industrialised nations is becoming increasingly contaminated with medicine residues. The microparticles are too small for conventional water purification plants. Nanomaterials can now be used to analyse and purify the water. In 2011, a project which received CTI support resulted in the founding of a start-up company in Basel.

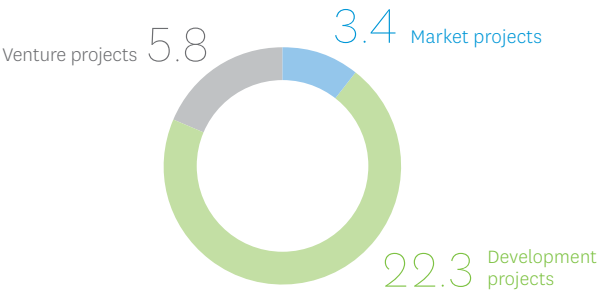
MICRO AND NANOTECHNOLOGIES
2011 IN FIGURES



Regular funding including vouchers

FEDERAL FUNDING IN CHF m*

15.4

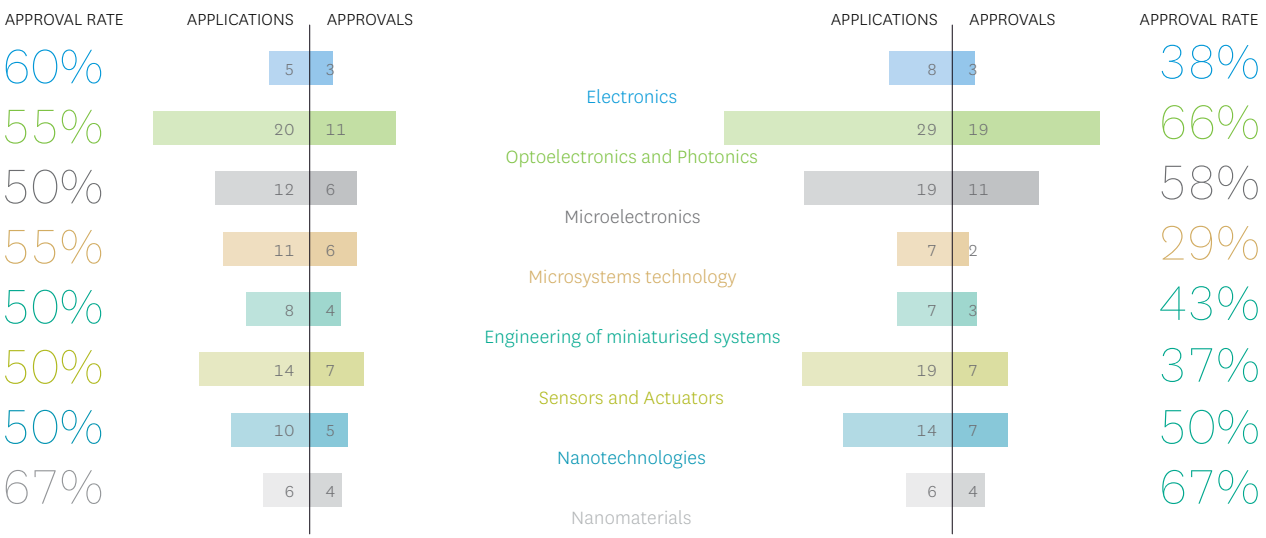


Special measures

FEDERAL FUNDING IN CHF m*

31.6

At CHF 31.6 million support from special measures for nanotechnology and microengineering is well above that from regular R&D funding.



Regular funding including vouchers

APPLICATIONS AND APPROVALS

53% 86 46

Special measures

APPLICATIONS AND APPROVALS

109 56 51%

Optoelectronics / Photonics is the most important discipline, both in terms of regular funding and special measures.

*Amount allocated.

MICRO AND NANOTECHNOLOGIES: SUCCESS STORY

BLUE LIGHT FOR THE FUTURE

The Zurich company Exalos, founded in 2003, is a good example of a globally active Swiss business. It has specialised in superluminescent light emitting diodes (SLED), which combine the advantages of laser diodes and LEDs. The company has worked with the EPFL to develop the first blue SLED.

The Zurich SME Exalos has a 40 per cent market share which makes it the world number one producer of superluminescent light emitting diodes (SLEDs). This light source combines two types of diode in one: Light Emitting Diodes (LEDs), which find a wide range of uses from simple display elements to room and street lighting and background lights in LCD televisions, and laser diodes, which can be used to generate a direct beam in laser pointers. Exalos has already been marketing SLEDs for eight years. This new technology can be applied in a variety of areas. Managing director Christian Velez sees the greatest market potential for SLEDs in so-called pico projectors (handheld projectors). These mini-projectors the size of an iPhone can create screen diagonals up to 2.5 meters long. Of course, this requires a sufficiently strong source of light. "You can achieve this with red, blue and green SLEDs. But at the moment, only red ones are available," Velez explains. In order to be prepared for tomorrow's market, Exalos worked with the EPFL on a CTI project to develop the first blue SLED.

EXPANDING THE PORTFOLIO

Current pico projectors use red, blue and green laser diodes. But because these colours only have a very narrow colour spectrum, this creates a grainy image which appears to flicker. "An SLED has a broad spectrum with a beam quality similar to that of a laser," Christian Velez explains. "So the image quality is better."

Exalos has patented the blue SLED, and the first components should be on the market from 2012. This puts the SME in a strong position. "It will find more and more applications. This development has already opened up new markets for our SME." This kind of light source is used in ophthalmology for a range of analytical processes, and SLEDs are also used in cell research and other areas of biotechnology

FLOURISHING MARKET AHEAD

However, the really big market will be in pico projectors. There are currently only a few hundred thousand of these devices on the market. But Velez reckons that the mini-projectors will one day be built directly into smartphones, which will really spur the market for these components.

But currently there is still no green SLED. This is being developed in another CTI project which has been running for about a year. So it will be some time before the first pico projectors with SLEDs appear on the market. Meanwhile, device manufacturers are mixing the different technologies and adding a green laser diode to the blue and red SLEDs.

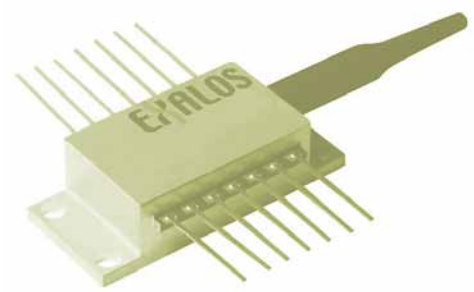
.

TECHNICAL CHALLENGE

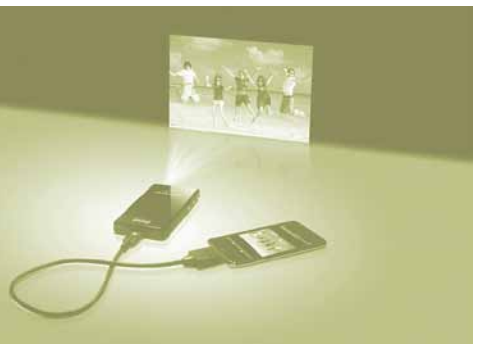
Light diodes are semi-conductor components which emit light across a broad spectrum and in all directions. Laser diodes, on the other hand, only emit colour in one direction. SLEDs combine these two features.

It is more difficult to manufacture a blue SLED than a blue laser diode. In a laser diode light is reflected between two mirrors and thus intensified. An SLED emits light much quicker than a laser diode. This means that the light is much less intense – or in other words, in order to attain the same light intensity as a laser diode, much more electricity is required," explains Nicolas Grandjean of the Laboratory of Advanced Semiconductors for Photonics and Electronics (LASPE).

Finding the right materials was also a challenge for the researchers. Semi-conductors for purple light diodes are made from indium-gallium-nitride. More indium is required to push the diode's colour spectrum more into the blue area, and this reduces the quality of the semi-conductor," Grandjean explains. Overcoming this challenge was a very important step in the project. However, it will be some time before pico projectors can be integrated directly into smartphones. But the researchers are already working on miniaturising the components and further reducing the amount of energy required.



The first blue SLEDs should be available on the market from 2012.



SLEDs can create better image quality in pico projectors.

START-UP AND ENTREPRENEURSHIP

Businesses with the CTI Start-up label created 200 new jobs in 2011

04.2

26 additional start-up companies with high growth potential are ready to take on the market

FARIS SABETI

VICE PRESIDENT, START-UP AND ENTREPRENEURSHIP

Faris Sabeti is the owner of Clarity, Geneva, and a partner and co-founder of BlueOcean Ventures in Geneva. BlueOcean Ventures is a private investment group which provides venture capital to early-stage companies. Faris Sabeti is also chairman of the board of BlueBotics SA and a board member of several other companies. He acts as a consultant in high-tech companies in particular. Faris Sabeti was previously a managing partner at SoftVision (workflow automation) and held managerial roles at Philipp Morris and Marc Rich + Co Ltd. Faris Sabeti studied computer science at the West London College of Science, obtained an MBA in Geneva and followed an Entrepreneurship Development programme at the MIT. He has been a coach at the CTI since 2001 and was involved in putting together the coaching team for start-ups.

The venture capital market for start-ups in Switzerland is drying up. CTI start-up promotion tries to provide an antidote to this trend, so that promising business ideas have a chance of success.

THE TRENDS

The CTI is noticing that promising start-ups, especially in the west of Switzerland, are moving away from bio and medtech towards the internet, with the creation of companies such as Doodle, the prominent CTI-label company which in 2011 attracted considerable investment from the Tamedia publishing group. There is also considerable entrepreneurship in material sciences, renewable energies and cleantech. One of these talented candidates is Greenmotion in Bussigny, an engineering firm which makes recharging stations for electric vehicles. These alternative fuel pumps can already be found at airports, company car parks, shopping malls and university campuses. Another is BioApply in Gland, where Frédéric Mauch and his team develop and produce packaging and crockery from biodegradable cellulose material.

Following in the footsteps of Logitech, the Zurich firm Dacuda has invented a combined mouse and scanner. Dacuda sells the licence for this technology to leading hardware and software manufacturers such as LG Electronics. The ETH spin-off received the Swiss Economic Forum Award 2011. ETH and EPFL continue to be the richest source of spin-offs, followed by the universities of applied sciences (UAS) in engineering and computer sciences.

ECONOMIC BENEFITS

CTI-certified young enterprises are some of the most innovative in Switzerland. They attract investor interest because the CTI label confirms that the company has a viable product to offer or a service which meets a real need. The organisation is well developed, the management has done its homework, for instance in terms of the protection of intellectual property or finance turnover planning. BlueBotics, an EPFL spin-off, was set up in 2001 and received the CTI label in 2007. The company produces mobile robots for use in industrial logistics. There are now 15 engineers working at BlueBotics and the company has a turnover of over one million francs. The example demonstrates that commercial success does not come over night for most start-ups. In some business areas, e.g. in biotechnology or medical technology, it takes five to eight years for companies to begin to make a profit.

In times of fierce competition for capital, it is particularly useful to have the CTI label. The amount of venture capital invested in Switzerland has dropped dramatically in the past five years, by about 40 per cent (SECA booklet no. 3, Venture Capital in Switzerland, 2010).

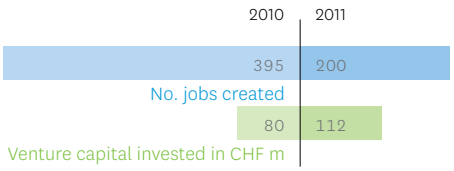
This puts Switzerland far behind other countries in Europe, which on average show an actual increase in investment levels. New business ideas which require start-up or early-stage investment are particularly hard hit. This is where CTI promotion of start-ups and entrepreneurship comes in, by organising training for young entrepreneurs and helping new ventures to get off the ground, for example in intellectual property protection, preparing the market launch or raising capital.

CTI Invest is the name given to the association of interested investors set up by the CTI in 2003, which now has about 80 members. In 2011 about 25 companies were presented to these members, who invested a total of about 300 million Swiss francs.

Finally, in 2011 the CTI supported a number of promising companies trying to become established in the USA. This form of business expansion support will be extended to other markets in 2012.

START-UP FUNDING AND ENTREPRENEURSHIP

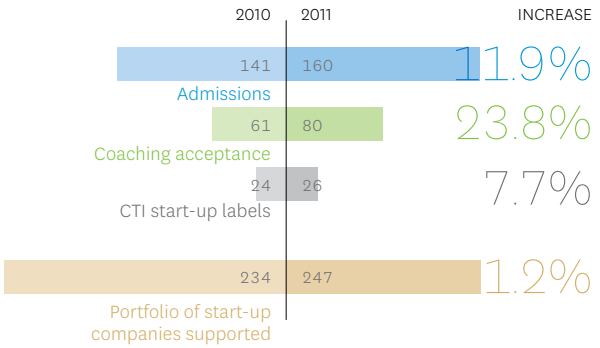
2011 IN FIGURES



Economic growth by CTI start-ups

JOBS CREATED SINCE 1996

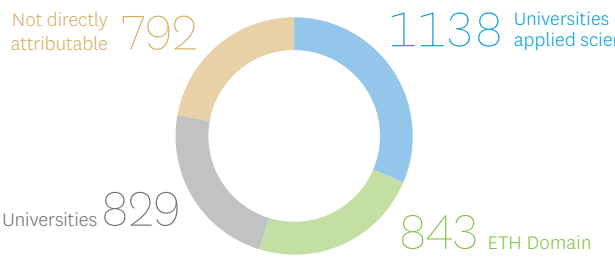
3700



Start-up funding by phase

NUMBER OF START-UP COMPANIES WITH THE CTI LABEL SINCE 1996

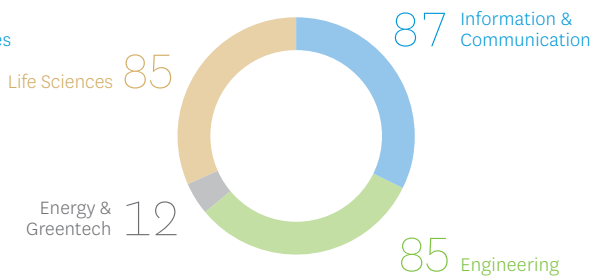
269



Participants of CTI awareness/ training modules for young entrepreneurs

BY INSTITUTION

3602



Start-ups with the CTI label since 1996

BY SECTOR

269

SUCCESS RATE CTI START-UPS

86%

In 2011, 26 new companies were awarded the CTI label. Start-up companies awarded the CTI label have an exceptionally high success rate.

START-UP AND ENTREPRENEURSHIP: SUCCESS STORY

SUPPORT EARLY ON BEARS FRUIT

A new artificial sphincter helps patients with chronic incontinence, in particular women. The start-up MyoPowers is working hard to make the implant marketable. The product promises to be a success: the market potential, estimated at over 700 million Swiss francs, is huge.

It is estimated that there are between 200 and 500 million people in the world who suffer from urinary incontinence. Between six and fifteen million have acute symptoms. For these patients, 85 per cent of whom are women, non-invasive methods are seldom sufficient to restore a satisfactory quality of life. Their only option is surgical intervention, for instance, having an artificial sphincter implant. However, the artificial sphincters currently available are anatomically unsuited to women. Help is at hand for this large patient group in the form of a new implant produced by MyoPowers SA, a spin-off from the Centre hospitalier universitaire vaudois (CHUV). “Our artificial sphincter is far smaller than existing solutions and can be easily opened and closed remotely,” explains Martin Horst, CEO of MyoPowers.

HUGE POTENTIAL

There is huge market potential; it is estimated that the market in the USA and EU alone is over 700 million francs. "According to reports in various American journals, the potential is even bigger,” says Horst. There are products on the market which do not work well and must be replaced. Horst has ambitious aims: “We want to have conquered a large share of the market within five years.” But there is plenty of work to do meanwhile. The product is currently being developed to the ISO standard for medical products so it can be launched on the market. The production process must also be optimised with the company’s partners and suppliers so that a viable sales price with acceptable margins can be achieved. “We are currently in discussions with medical insurance companies in a range of countries about who will pay for this treatment. We will only be able to sell our product successfully once this has been established,” Horst explains.

MORE INVESTMENT NEEDED

Long-term studies have shown that the concept is feasible. At the end of 2012 MyoPowers will be going into European clinics and carrying out studies on patients. As soon as the results are available, they can apply for certification in different countries. It is planned to launch the product at the end of 2013. MyoPowers will initially focus on Switzerland, Germany, France and the UK. Then they will move onto other European countries and finally the USA. The money required to launch the artifical sphincter on the European market has been secured.

MyoPowers recently received investment to the amount of CHF 16 million. But developing products in medical technology is very expensive, and MyoPowers must raise additional capital. “We require a further 10 to 15 million francs of investment to launch the product in the USA,” explains Horst.

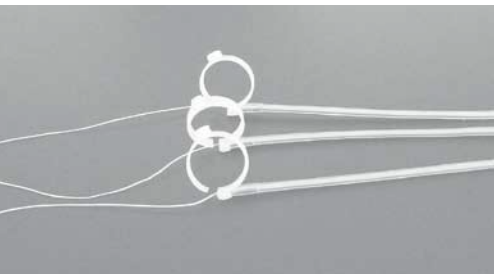
CTI START-UP ASSISTANCE

The CTI Innovation Promotion Agency helped to fund the development of this artificial sphincter, in which several higher education institutions have been involved. The University of Applied Sciences (UAS) of Canton Vaud in Yverdon developed the steering, the Vaud university hospital centre CHUV and the Institute for Biomedical Engineering at the University of Basel carried out clinical trials. “The CTI gave us some valuable contacts,” explains Horst. The financial backing also helped to develop the product to a point at which the first investors could be attracted. Horst believes that the CTI Start-up label awarded in September 2009 to NanoPowers, as MyoPowers was then known, also helped: “In Switzerland the CTI Start-up label is held in high regard. The award reassures private investors in particular.”

HOW THE ARTIFICIAL MUSCLE WORKS

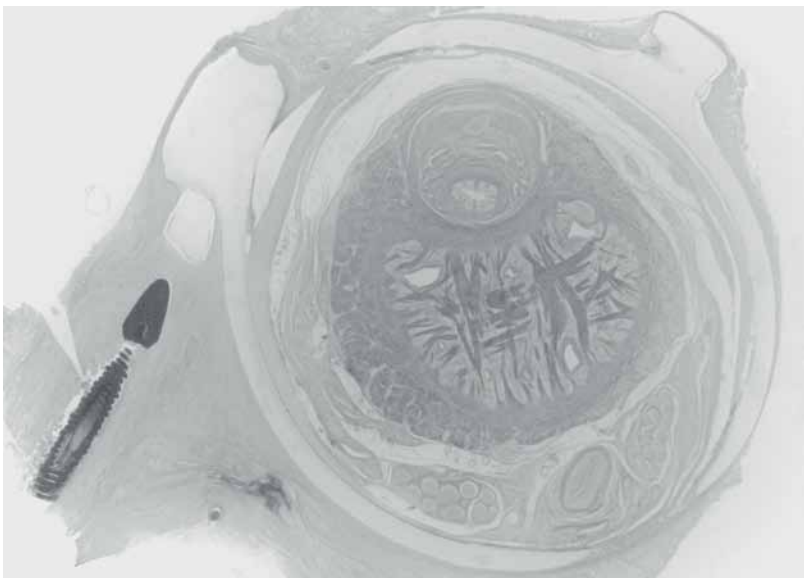
Conventional implants function by placing a relatively wide cuff around the urethra, which then fills with urine and is emptied. In MyoPowers' artificial sphincter two narrow cuffs are placed around the urethra which are drawn together alternately by fine wires controlled by an actuator. Whereas a conventional cuff expands when the urethra is closed off, the MyoPowers rings become smaller. This makes it much easier to treat female patients. The alternating movement of the cuffs also reduces the pressure on the tissue underneath.

The implanted supply and regulating device can be controlled by remote control. A doctor can set the degree to which the rings contract at any time.



The core of the artificial urethra muscle: narrow cuffs that are tightened using fine wires.

Histology of in vivo attempts on a sheep: cross-section of the urethra with cuff and original actuator.



KTT SUPPORT
Reorganised

04.3

Contact opportunities, information and good advice

DR MYRIAM MEYER
VICE PRESIDENT, KTT SUPPORT

Dr Meyer, who holds a doctorate from the ETH in machine engineering, has many years of experience in industry, from aviation to machine engineering and pharmaceuticals. She has held several demanding managerial and CEO positions in her career so far. In addition to gaining broad practical experience, she has continued her training, e.g. in Stanford, at INSEAD Fontainebleau and London Business School. Recently she also completed the intensive course for executive board members at the HSG St. Gallen. She is currently working as a consultant in the field of strategy, management, technology and innovation. She was appointed to the CTI by the Federal Council in 2011.

KTT, or knowledge and technology transfer between industry and research, is a key element in innovation promotion. The CTI plans to reorganise this area and in 2011 lay the foundations with its new KTT strategy.

For projects and start-up ideas to even have a chance of getting off the ground, those involved must have opportunities to meet and exchange information and advice within the system of universities, companies and public organisations. In other words, they require support in knowledge and technology transfer (KTT). During the process of becoming an independent commission, the CTI reviewed the way in which it promotes KTT Support. In 2011 the Board revised the CTI's KTT strategy, referring to the experience of the past few years and on two external studies, the Fraunhofer study, which looked closely at the KTT consortiums by carrying out a survey among businesses, and a broad-based 'KTT audit', which examined the complete KTT Support system in Switzerland, including both types of CTI consortium.

THE CTI ANALYSED THE RESULTS AS FOLLOWS:

— The KTT Support network is very wide-ranging and dynamic, with many persons involved. For those who benefit from it, especially SMEs, the system should be made as clear and simple as possible, but without compromising the innovative spirit that this variety generates. It would be impracticable to centrally decree a complete reorganisation of the system. The CTI wants to help to make it simpler by encouraging good practices.
— The CTI-supported consortiums have also developed considerably, with the result that there is now considerable overlap with the CTI's objectives.
— The CTI is to focus on its national role; partners and solutions will be sought on a national rather than regional level for CTI-supported research-based innovation. Regional promotion activities will receive support from other bodies.
— The CTI can increase its influence by streamlining its KTT Support activities.

CONCLUSIONS

The CTI Executive Board has therefore decided to reformulate its KTT strategy and base it on three main areas. In future support will be given to only one type of network which will have a national focus and be devoted to one innovation issue. Innovation mentors with direct access to interested business, in particular SMEs, will form the core of a modern CTI networking system designed to promote trade and industry. Its work will be complemented by effective platforms in the form of events and websites, where interest groups can find information and share ideas and experiences.

The new CTI KTT strategy will come into effect in 2013. Up until then current support strategy continues to apply.

KTT STRATEGY WITH THREE AXES

ALL NATIONAL THEMATIC

INNOVATION MENTORS

— Initial information to SMEs about innovation possibilities
— Mentors, experienced and well connected, but also independent
— Part time mandate, employed in other organisations
— Managed by CTI: accredited, trained

PLATFORMS

Physical KTT events
— CTI provides match funding

Web portal
— Information about innovation promotion and KTT Support
— Financed and run by CTI
— Cooperation with suitable partners

NATIONAL THEMATIC NETWORKS

— Funding for agreed services
— Themes determined on bottom-up basis: new calls based on criteria
— Long term, accompanied by controlling

EXPERT TEAM

The funded activities are steered by the head of the funding area
and five CTI commission members.

FACTS AND FIGURES FOR

2011

05

PART V

CTI TECHNOLOGY AND INNOVATION PROMOTION
2011

in CHF	Preliminary credit	Payments
Wages and employer's contributions		277 087
General consultancy expenses		2 720 028
General employee consultancy expenses		2 537 349
Commissions		53 702
Actual expenses		776
Other contributions to third parties		155 917 735
R&D project funding		60 085 693
Knowledge and technology transfer		3 749 000
Start-up funding and entrepreneurship		9 372 851
"Strong franc" special and compensatory measures		82 710 191
TOTAL	**226 975 600**	**161 506 586**

INCOME STATEMENT
2011

in CHF	Budget	Payments
BUDGET AND INCOME STATEMENT: ADMINISTRATION		
EXPENDITURE	**4 491 700**	**4 267 835**
Salaries and employer's contributions	3 105 300	3 105 022
Other staff expenses	66 800	27 005
Rent expense	190 200	189 808
IT equipment	871 600	796 248
Consultation fees	54 100	40 316
Other operating expenses	203 700	109 437
REVENUE	**760 000**	**1 807 881**
Payment (CTI project reimbursements)	760 000	1 807 881

CTI STAFF

	End of 2010	End of 2011
No. staff	23	30
male	11	15
female	12	15
Of which are compensatory measures (limited to 2011)		8
CTI management	3	2
R&D project funding and KTT	15	15
Start-up and entrepreneurship	5	5
Resource management	0	8
Full-time job equivalent	20.1	28.1
Of which are compensatory measures (limited to 2011)		7.8

COMMISSION MEMBERS AND COACHES AS PER END OF 2011

	End of 2010
No. commission members	55
of which on Executive Board	6
No. coaches (excl. commission members)	55

DIRECTORY

The CTI has 56 experts, supports 18 networks and employs around 55 coaches for companies

06

PART VI

Experts, coaches and networks

List of CTI-funded KTT networks

CHost

In KTT CHost a range of research institutions and universities operating in similar fields have joined forces to provide sustained support for the innovative activities of businesses in the east of Switzerland. The University of St. Gallen, the HTW in Chur, the HSR Rapperswil, NTB Buchs, Empa and the Lake Constance nanocluster provide critical resources to the four core fields in the east of Switzerland: textiles, machine engineering, plastics and surface structures. Alongside technological know-how, these include innovation management methods, laboratory infrastructure and an internationally renowned network of experts.

ALLIANCE

Alliance is the Knowledge and Technology Transfer network in the French and Italian-speaking parts of Switzerland (Ticinotransfer). The network includes all higher education institutions (the EPFL, the universities of Fribourg, Geneva, Lausanne, Neuchâtel, the Università della Svizzera italiana, the universities of applied sciences of Western Switzerland and Southern Switzerland), the university hospitals in Geneva and Lausanne, the CSEM and Idiap research institutes and associations such as Swissmem. Alliance puts businesses into contact with scientific institutions in order to facilitate cooperation and technology transfers. Since it was set up in 2005, Alliance has supported over 700 businesses and initiated almost 200 joint ventures.

W^6

Established in 2006, the aim of the W^6 network is to strengthen the transfer of technology between universities and the world of business. W^6 stands for 'Win-Win für Wissenschaft und Wirtschaft durch wirksamen Wissens- und Technologie¬transfer' ['win-win for science and business thanks to effective knowledge and technology transfer']. W^6's activities are focused on a few key areas divided into associated specialist fields; Life Sciences/MedTech Biology on the one hand and the Material/Timber/Engineering Sciences/MedTech Engineering on the other, which covers large areas of the technical sciences.

WKNW

The KTT network Northwest Switzerland (WKNW) operates in the cantons of Aargau, Basel-Stadt, Basel-Landschaft, Jura and Solothurn. The WKNW's aim is to strengthen the competitiveness of local businesses by providing them with targeted innovation support. An extensive network of scouts and innovation coaches provides businesses with information and following an innovation check-up, suitable knowledge partners are found for them either in Switzerland or abroad. In some cases, companies also receive follow-up project support. This enables businesses to benefit from the established WKNW network and from its solid links with the regional universities.

Affiliated to the WKNW are two independent sub-networks, ITZ and eco.net.ch.

ITZ

InnovationsTransfer Zentralschweiz (ITZ) [Innovation Transfer Central Switzerland] organises knowledge and technology transfer and brings together partners in the WKNW's sub-network for Central Switzerland. This network works with innovation coaches who are not tied to a specific discipline, but can provide any SME with a 'single point of entry' in their immediate region, giving them low-threshold access to KTT, both on a national and international level. In Lucerne and Berne there are also innovation coaches operating in the specialist area of Design Management.

ECO-NET.CH

eco-net is the Confederation's network for Knowledge and Technology Transfer in the environment and energy field. eco-net brings together business and science in the areas of environmental technology and resource efficiency in order to encourage projects to improve ecological efficiency and business competitiveness.

ENERGIE-CLUSTER.CH

energie-cluster.ch is an association with about 500 members, of which about 80 per cent are SMEs operating in the energy domain. The association specialises in technology transfer and coaching in this field, acting as a catalyst and accompanying projects from the initial idea all the way through to the finished product or new service. energie-cluster.ch also organises training courses in a range of areas and on a range of topics, e.g. comfort ventilation, heat insulation, metering or plus-energy houses. Professionals and business representatives are invited to 'energy drinks parties', at which the latest topics are discussed. energie-cluster.ch is also involved in export promotion, organising shared booths at well-known trade fairs in Germany (Hannover Messe), Austria (Energiesparmesse Wels) and Poland (POLEKO). It produces a bimonthly newsletter with a distribution of about 35,000 recipients to inform people of its current activities.

List of CTI-funded R&D networks

WWW.BIOTECHNET.CH
In biotechnet Switzerland the university of applied sciences faculties in Wädenswil, Muttenz and Sion combine their expertise in research and development, training and CET programmes for the biotechnology industry. They provide access to infrastructure and a wide range of high level expertise in the biotech field.

WWW.BRENET.CH
brenet (building and renewable energies network of technology) is a network established between Swiss universities of applied sciences, research institutes at the ETH and EPFL and private institutions working in building technology and renewable energies. Its role is to encourage a holistic approach to buildings and exert a sustainable influence on the building technology sector, paying particular attention to environmental and economic factors.

WWW.ECADEMY.CH
The Ecademy is the national R&D network of Swiss universities, companies and public institutions for creating ICT-supported, sustainable business models and business processes. It combines training, research and practice to promote Switzerland's competitiveness in a globalised information and knowledge society.

WWW.MANUFUTURE.CH
ManuFuture-CH is the Swiss subsidiary of the European ManuFuture platform. Its focus is MEM and related industries. In particular it addresses SMEs looking for contact with other companies in their segment or for development partners. The manufacturing industry is the basis for successful product development in medical technology, biotechnology, the watch industry, precision instruments, microtechnology and nanotechnology, energy technology and the chemical/pharmaceutical industries.

WWW.NETZWERKHOLZ.CH
In March 2000 the national competence network of the universities of applied sciences for the wood industry was founded by the Architecture, Wood and Civil Engineering Department of Bern UAS in Biel with 12 partners from all of the universities of applied sciences. The network partners' aim is to work with the wood industry primarily in research and development projects, and thereby deploy the knowledge and expertise of almost 200 specialists in all parts of the country.

WWW.FOODRESEARCH.CH
The R&D network, Swiss Food Research, is a network of publicly financed Swiss universities and research institutes, founded with the objective of promoting the competitiveness of the Swiss food industry and its suppliers. The Federation of Swiss Food Industries (FIAL) is also a member of the network.

WWW.SWISSPHOTONICS.NET
The Swiss Photonics and Laser Network is an R&D network of public research and development institutions in Switzerland in microtechnology and nanotechnology. It helps industries searching for skills and expertise for their projects to gain simple access to the latest knowledge and supports them in finding original solutions for industrial partners.

WWW.SWISSMNTNETWORK.CH
The Swiss MNT Network is an R&D network of public research and development institutions in Switzerland in microtechnology and nanotechnology. It helps industries searching for skills and expertise for their projects to gain simple access to the latest knowledge and supports them in finding original ideas.

WWW.TOURESPACE.CH

TourEspace is the national competence network for tourism and the lived environment, which operates both on a regional/local level, as well as nationally and internationally. Its objective is to increase the competitiveness of the tourist industry, encourage development in tourism and the lived environment and contribute to the sustainable development of the lived environment.

WWW.SUSTAINABLEENGINEERING.CH

The slogan of the Sustainable Engineering Network Switzerland is 'Contributing to the environment with economic success'. This addresses the immediate and long-term sustainable protection of resources. The network operates in an interdisciplinary fashion, providing innovative solutions in the fields of 'environmental product development', 'efficient resource use', 'reducing noise pollution' 'improving air quality', 'increasing drinking water and waste water quality' and 'better use of waste materials'.

CRAG.HESGE.CH/SERVICE SCIENCE

The Swiss Institute of Service Science SISS is the competence network for service research, in particular in the field of IT-supported services. It serves the service sector and the Swiss mechanical engineering industry. One of its key functions is to provide a consistent link between the three disciplines of Technology, Economics and Social Sciences by bringing together specialists from the different fields.

CTI Expert Teams

ENABLING SCIENCES

HEAD

Dr Martin Müller, Unterlunkhofen

MEMBERS

Marianne Daepp, Maur
Janine Graf, Stäfa
Dr Paul-Eric Gygax, Steffisburg
Dr Matthias Kaiserswerth, Rüschlikon
Reiner Lustenberger, Richterswil
Dr Fiorenzo Scaroni, Minusio
Dr Pascal Sieber, Berne
Jürg Stucki, Berne
Walter Stulzer, Zurich
Beat Sutter, Walchwil
Dr Rolf Wohlgemuth, Zurich

LIFE SCIENCES

HEAD

Prof. Dr Beda Stadler, Berne

MEMBERS

Dr Josef X. Brunner, Landquart
Prof. Ruth Freitag, Lausanne
Prof. Dr Peter Frey, Epalinges
Prof. Oreste Ghisalba, Reinach
Dr Barbara Keller, Thayngen
Dr Hans-Peter Meyer, Visp
Prof. Lutz P. Nolte, Berne
Prof. René P. Salathé, Lausanne
Dr Manfred Schawaller, Cressier sur Morat
Prof. Gabor Szekely, Zurich
Prof. Dolf van Loon, Oberhasli
Prof. Erich J. Windhab, Zurich
Prof. Hans-Jörg Zweifel, Unterengstringen

ENGINEERING SCIENCES

HEAD

Dr Felix Bagdasarjanz, Oberrohrdorf

MEMBERS

Dr Bruno Covelli, Wohlen
Dr Roland Gallay, Farvagny-le-Petit
Prof. Jacques Giovanola, Lausanne
Prof. Lino Guzzella, Zurich
Dr Stefan Nowak, St. Ursen
Dr Pierre Pahud, Le Landeron
Dr Martin Riediker, Seltisberg
Prof. Philipp Rudolf von Rohr, Zurich
Dr Rolf Schmitz, Ittigen
Daniel Zürcher, Ittigen
Dr Fabian Zwick, Bützberg

MICRO AND NANOTECHNOLOGIES

HEAD

Prof. Martina Hirayama, Winterthur
Dr Raymond Zehringer, Muttenz

MEMBERS

Dr Marc Degrauwe, Chez-le-Bart
Prof. Alex Dommann, Neuenburg
Andreas Reber, Biel
Dr Markus Rossi, Rüschlikon
Prof. Louis Schlapbach, Muri
Dr Berthold Schmidt, Jona-Kempraten
Prof. Marcus Textor, Zurich

CTI Start-up Coaches

HEAD

Christian Brand, Berne (ICT)
Peter Harboe-Schmidt, Nyon (LS/MD))
Faris Sabeti , Versoix (ICT)

COACHES

Dr Urs Althaus, Ortschwaben (ICT)
Richard J. Andrews, Givrins (LS/MD)
Jean-Jacques Becciolini, Geroldswil (Eng./Intd)
Peter Cairoli, Füllinsdorf (Eng./Intd)
Gilles Chevrey, Geneva (Organisational Development)
Ulf Claesson, Wettswil (General Management)
Dr Silvano Cometta, Wallisellen (LS/MD)
Dr Pierre Comte, Kilchberg (LS/MD)
Sandro Cornella, Zurich (ICT)
Alberto De-Lorenzi, Bioggio (ICT)
Emmanuel de Watteville, Plan-les-Ouates (Eng./Intd)
Charles d'Heureuse, Schindellegi (ICT)
Dr Benoît Dubuis, Plan-les-Ouates (LS/MD)
Pascal Dutheil, Lausanne (ICT)
Tim Dyer, Geneva (LS/MD)
Jean-Daniel Favre, Sion (Finance)
Claude Florin, Genolier (ICT)
Dr Raymond Gallusser, Berne (Eng./Intd)
Dr Marcos Garcia Pedraza, Menzingen (LS/MD)
Paola Ghillani, Zurich (Eng./Intd)
Dr François Gilardoni, Plan-les-Ouates (LS/MD)
Gnanasagree (Nanci) Govinder, Lausanne (LS/MD)
Henning Grossmann, Baar (ICT)
Dr Urs Guggenbühl, Zurich (ICT)
Dr Jost Harr, Witterswil (LS/MD)
Reto Hartmann, Lausanne (LS/MD)
Christoph Heidelberger, Zurich (ICT)
Prof. Martin J. Horst, Hergiswil (LS/MD)
Simon Johnson, Lausanne (ICT)
Jörg Korner, Baar (ICT)
Dr Monika Krüsi, Zollikon (ICT)
Felix Kunz, Solothurn (ICT)
Jean-Philippe Lallement, Lausanne (ICT)
Jesús Martin-Garcia, Plan-les-Ouates (LS/MD)
Didier Mesnier, Geneva (ICT)
Dr Markus Oswald, Schwyz (Eng./Intd)
Hans Oury, Zug (ICT)
Roland Pesty, Lausanne (Engl./Intd)
Eric Plan, Sion (LS/MD)
Jean-Philippe Rickenbach, Meilen (Finance)
Mahmud Samandari, Vessy (ICT)
Robert Schier, Nyon (LS/MD)
Dr Michael Sidler, Kirchdorf (LS/MD)
Lesley Spiegel, Zurich (LS/MD)
Eugen Stalder, Zurich (Eng./Intd)
Pierre Strübin, Plan-les-Ouates (Eng./Intd)
Tomas J. Svoboda, Geneva (LS/MD)
Paul-André Vogel, Sion (Eng./Intd)
Jean-Pierre Vuilleumier, Mörigen (Finance)
Josef Walker, Chur (LS/MD)
Beat Walther, Zurich (ICT)
Jean-Marc Wismer, Lausanne (LS/MD)
Christian Wolf, Vaduz (Eng./Intd)
Martin Wyttenbach, Cham (Eng./Intd)

Abbreviations:
LS/MD (Life Science/Medical Devices)
ICT (Information & Communication Technology)
Eng./Intd (Engineering/Interdisciplinary)

CTI CERTIFICATION BOARD

Dr Urs Althaus, Ortschwaben
Dr Brigitte Baumann, Zurich
Jan Burger, Zurich
Prof. Fritz Fahrni, Zurich
Prof. Denis Hochstrasser, Geneva
Beth Krasna, Chêne-Bougeries
Dr Bruno Oesch, Stilli
Prof. Jane Royston, Founex
Jakob Schlapbach, Oberrohrdorf
Prof. Beda Stadler, Berne
Walter Steinlin, Berne
Ernst Uhlmann, Diessenhofen

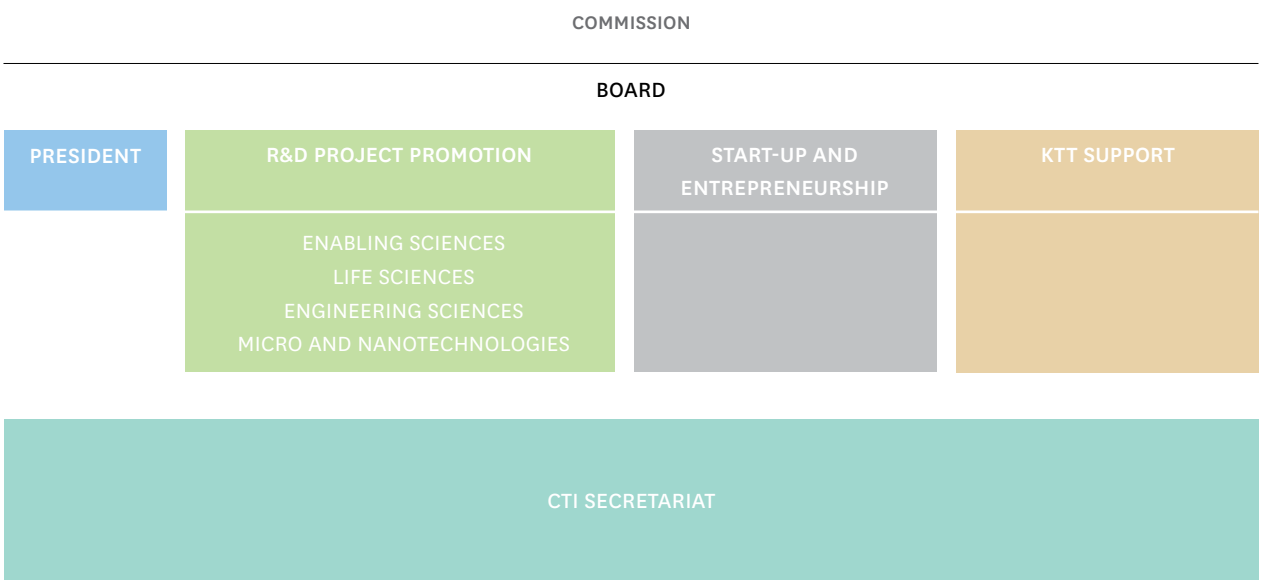
WTT Support, R&D Networks, Diversity Management

WTT-SUPPORT
HEAD
Dr Myriam Meyer

R&D NETWORKS
HEAD
Reiner Lustenberger, Richterswil
Dr Fiorenzo Scaroni, Minusio

DIVERSITY MANAGEMENT
HEAD
Dr Brigitte Baumann, Zurich

CTI Organisation Chart



Frequently used abbreviations

OPET	Federal Office for Professional Education and Technology
ERI	Education, Research and Innovation
CEO	Chief Executive Officer
CHF	Swiss franc
CSEM	Swiss Center for Electronics and Microtechnology
CTI	Commission for Technology and Innovation
CTO	Chief Technical Officer
EAWAG	Swiss Federal Institute of Aquatic Science and Technology in the ETH Domain
FDHA	Federal Department of Home Affairs
EMPA	Swiss Federal Laboratories for Materials Testing and Research
EPFL	Federal Institute of Technology Lausanne
ETHZ	Federal Institute of Technology Zurich
FDEA	Federal Department of Economic Affairs
R&D	Research and Development
UAS	University/ies of applied sciences
RIPA	Research and Innovation Promotion Act
HSG	University of St. Gallen
ICT	Information and Communications Technologies
IPR	Intellectual Property Rights
SME	Small and Medium-sized Enterprises
CTI	Commission for Technology and Innovation
NW	Northwest
SER	State Secretariat for Education and Research
SECO	State Secretariat for Economic Affairs
SNSF	Swiss National Science Foundation
SUPSI	University of Applied Sciences and Arts of Southern Switzerland
RIPO	Research and Innovation Promotion Ordinance
KTT	Knowledge and Technology Transfer
ZHAW	Zurich University of Applied Sciences

Publication details

PUBLISHER
Commission for Technology and Innovation CTI

EDITOR
Walter Steinlin
Dr Klara Sekanina
Eclat, Erlenbach ZH
Sprachwerk, Zurich

STATISTICS
Adrian Berwert

REFERENCE
info@kti.admin.ch

CONCEPT, DESIGN
Eclat, Erlenbach ZH

PHOTOGRAPHY
Ruben Wyttenbach, Berne, all portraits (except Page 11)
dukta.com (Page 33) / iStockphoto (Page 37 left)
Molecular Partners (Page 37 right)
Pixelio/Claudia Hautumm (Page 38 left)
Florin AG (Page 38 right) / Posalux (Page 43)
Microvision (Page 48, left/centre) / Exalos (Page 48, right)
MyoPowers (Page 54)

MIX
Aus verantwortungsvollen Quellen
FSC® C016003
www.fsc.org

“We had excellent results with the CTI project. We were able to create new and interesting jobs in Switzerland.”

CHRISTIAN VÉLÉZ
EXALOS AG

“We were particularly impressed by the way in which the research scientists always got actively involved in market orientation and had a flexible approach to requests.”

ANDREAS SCHNEIDER AND ROLAND ARTMANN
SCHREINEREI SCHNEIDER AG, PRATTELN

“CTI coaching helped us enormously.”

NICOLA TOMATIS
BLUEBOTICS SA

“My personal advice is: take your best idea, talk to partners, submit an application to the CTI and go for it.”

EMMANUEL DELAMARCHE
IBM RESEARCH

“The combination of business and science is essential for any technology-based start-up company.”

ANIL SETHI
FLISOM AG

Commission for Technology and Innovation CTI
Innovation Promotion Agency
Effingerstrasse 27
CH-3003 Berne
www.kti.admin.ch