

## OECD SCIENCE, TECHNOLOGY AND INDUSTRY OUTLOOK 2004 COUNTRY RESPONSE TO POLICY QUESTIONNAIRE

### SWITZERLAND

#### 1. General framework and trends in science, technology, and innovation policy

In Switzerland, federal and cantonal authorities share responsibility for policies in the fields of education, research, technology and innovation. In the course of the development of the federal state, the powers at federal level steadily gained in importance. Nowadays, the single most important, comprehensive framework is the federal government's programme paper for the promotion of education, research and technology, the so-called ERT-message<sup>1</sup>, which is drafted every four years. It contains the policy objectives as well as a detailed account of the proposed measures (legal changes, credit requests, etc.) for the next period.

##### *ERT-message 2000-2003*<sup>2</sup>

The period under review corresponds to the last two years of the ERT-message 2000-2003. Major changes in legislation and institutions were introduced in the first two years of this period<sup>3</sup>. More recently, the implementation of these modifications has been in the forefront.

##### *ERT-message 2004-2007*<sup>4</sup>

The years 2002 and 2003 were primarily devoted to the preparation of and decision about the ERT-message 2004-2007<sup>5</sup>. The discussions in Parliament revolved round the question of how much to increase public spending in this field, since there was a broad consensus on the contents. Finally, Parliament

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<sup>1</sup> The "Message concerning the Promotion of Education, Research, and Technology" (ERT-message) is issued by the Federal Council and transmitted to Parliament for discussion and decision.

<sup>2</sup> The message is available in German at <http://www.bbw.admin.ch/html/pages/bft/d/bbtdindex.html> or in French at <http://www.bbw.admin.ch/html/pages/bft/f/bbtfindex.html>.

<sup>3</sup> For further details see the Swiss contribution to the OECD Outlook 2002 available at <http://www.oecd.org/dataoecd/46/50/2765813.pdf>.

<sup>4</sup> The message is available in German at <http://www.admin.ch/ch/d/ff/2003/2363.pdf> or in French at <http://www.admin.ch/ch/f/ff/2003/2067.pdf>. An English summary is available at [http://www.bbw.admin.ch/html/pages/bft/2002/brosch\\_e.pdf](http://www.bbw.admin.ch/html/pages/bft/2002/brosch_e.pdf).

<sup>5</sup> The message was issued by the Federal Council on November 29<sup>th</sup>, 2002 and was discussed in Parliament between May and October 2003.

accepted education, research and technology as a priority field for government policy<sup>6</sup>, and consequently agreed to an above-average increase in financial resources. The message, covering measures worth more than CHF 4 billion per year, states the following objectives:

- Updating the teaching structure
- Increasing research activities
- Promoting innovation
- Intensifying national and international co-operation

### ***Action plan for the promotion of innovation and entrepreneurship<sup>7</sup>***

As a complementary measure to the ERT-message 2004-2007, the Federal Department of Economic Affairs launched an action plan to stimulate innovation and entrepreneurship. Four main topics were highlighted:

1. Strengthening education, research and technology
2. Furthering entrepreneurship
3. Enhancing science-industry relationships
4. Learning through international benchmarking

### ***Action plan to overcome sluggish economic growth***

For many years now, Switzerland has been characterised by sluggish economic growth. On February 18<sup>th</sup>, 2004, the Federal Council decided to bundle different measures to cope with insufficient growth, and issued a timetable for their realisation in the next three years<sup>8</sup>. This decision is based on the proposed measures of an inter-ministerial working group<sup>9</sup>. This group could benefit from extensive analysis of the unsatisfactory growth pattern and its determinants<sup>10</sup>. Human capital and innovation are seen as two important drivers of economic growth.

Several mechanisms are in place to insure the co-ordination of the proposed measures of the ERT-message as well as the two action plans.

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<sup>6</sup> In the document stating the objectives of the Federal Council for 2004, research and education are mentioned as one of 19 priorities of government policy.

<sup>7</sup> The action plan was published on June, 13<sup>th</sup>, 2003, and is available in German at [http://www.evd.admin.ch/imperia/md/content/brochures/offt/innonation\\_d.pdf](http://www.evd.admin.ch/imperia/md/content/brochures/offt/innonation_d.pdf) or in French at [http://www.evd.admin.ch/imperia/md/content/brochures/offt/innonation\\_f.pdf](http://www.evd.admin.ch/imperia/md/content/brochures/offt/innonation_f.pdf).

<sup>8</sup> The press release is available in French at [http://www.bk.admin.ch/cp/f/40337340\\_3@presse1.admin.ch.html](http://www.bk.admin.ch/cp/f/40337340_3@presse1.admin.ch.html).

<sup>9</sup> The report is available in German at [http://www.seco-admin.ch/imperia/md/content/analysenundzahlen/strukturanalysenundwirtschaftswachstum/ida\\_wachstum\\_bericht\\_dez02\\_d.pdf](http://www.seco.admin.ch/imperia/md/content/analysenundzahlen/strukturanalysenundwirtschaftswachstum/ida_wachstum_bericht_dez02_d.pdf).

<sup>10</sup> The growth report is available in German at [http://www.seco-admin.ch/imperia/md/content/analysenundzahlen/strukturanalysenundwirtschaftswachstum/rapport\\_croissance\\_d.pdf](http://www.seco-admin.ch/imperia/md/content/analysenundzahlen/strukturanalysenundwirtschaftswachstum/rapport_croissance_d.pdf).

## **2. Public sector research and public research organisations**

### ***Policy changes related to R&D performed by public sector organisations***

#### *Shifts in the allocation of funding*

In 2001, a new instrument for research promotion, the National Centres of Competence in Research (NCCR), went into operation. 14 centres have been established up to now. For the years 2004-2007, additional CHF 30 million will be provided to finance 5-6 new NCCRs. It was agreed, that these new NCCRs would be in social sciences and humanities, since a national evaluation of these fields had revealed that they need special financial support. The 14 NCCRs that have been supported in the last years were - except for two - exclusively related to natural and biomedical sciences.

#### *Changes in the use of different types of funding instruments for financing R&D*

Since January 2004 Switzerland is fully associated with the 6<sup>th</sup> EU framework programme for research and technology development 2003-2006 (FP6)<sup>11</sup>. Switzerland will contribute every year CHF 200-220 million to FP6, and in turn Swiss researchers and SME`s will get funding directly from the European Commission. In former years, researchers and SME`s could participate but were funded through a national agency.

### ***Initiatives to reform the organisation and governance of universities and public research organisations***

#### *Initiatives to increase the flexibility and/or accountability of universities and public research organisations*

The ETH domain with its two federal institutes of technology and 4 research institutes was granted more autonomy by the revision of the ETH law<sup>12</sup>. The domain was already funded by lump sum grants; it can now hold interests in spin-offs, and its research institutes get full autonomy. Performance targets are given by the Federal Council and approved by Parliament.

Following the initiative of the Swiss Conference of the Cantonal Ministers of Education, a working group was created in 2003 to elaborate a so called "master plan" dealing with the perspectives of the universities, of the universities of applied sciences and of vocational education. Representatives of the cantonal and the federal administrations as well as of the universities and universities of applied sciences will develop a common vision on objectives and measures in the tertiary education system. In the long run, the "master plan" may become the basis of a new university law and a new article in the Swiss constitution.

#### *Changes in procedures for evaluating research results, researchers, or institutional performance; establishment of national criteria and priorities for government support*

There are many institutions which mandate and/or implement evaluations, ranging from the Federal Council to the single university. To underpin and promote the quality of teaching and research at the universities in Switzerland the Center of Accreditation and Quality Assurance (OAQ) of the Swiss universities was founded in October 2001. Its tasks are to develop guidelines and quality standards for academic accreditation in Switzerland, to perform accreditation of public and private institutions as well as

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<sup>11</sup> The agreement is available in German at [http://www.euresearch.ch/forms/files/Abkommen\\_D.pdf](http://www.euresearch.ch/forms/files/Abkommen_D.pdf) and in French at [http://www.euresearch.ch/forms/files/Abkommen\\_F.pdf](http://www.euresearch.ch/forms/files/Abkommen_F.pdf).

<sup>12</sup> The revision of the law came into effect on January 1<sup>st</sup>, 2004.

programmes at university level and to draw up recommendations for quality assurance at the universities. During the last two years the general directions for accreditation have been established, and the OAQ prepared a concept for carrying out summary quality audits on behalf of the Federal Office for Education and Science (FOES). Evaluations of this type are a mandatory part of the qualifying procedure for financial support.

#### *New organisational structures for performing R&D*

See above under 2.1: NCCR.

#### ***Policies and government-sponsored programmes to foster international collaboration among researchers in universities and public research organisations***

In March 2001, a working group representing research organisations, universities, administration, science policy and external affairs policy published a report on Swiss foreign policy in sciences. In this report a bottom-up approach for international co-operation is favoured. It stresses the importance of individual co-operation at the level of private firms and/or public research organisations for international co-operation. The government only has a subsidiary function.

In addition to the co-operation between individual researchers and institutions, in recent years the federal authorities have signed several agreements dealing with co-operation in research with different nations. In negotiations with the EU the full association to FP6 was agreed upon in January 2004. Switzerland takes part in the European “Bologna process”, and several programmes of the Swiss National Science Foundation (SNF) support international research co-operation and mobility.

Several credit lines aiming at supporting the participation of Swiss scientists in projects run by international (mostly European) research organisations have been brought together in the new ERT-message. They help to finance the Swiss contributions to the large detectors ATLAS and CMS of the LHC, the Large Hadron Collider currently under construction at CERN, as well as contributions to new instruments of ESO (European Southern Observatory).

Swiss researchers at public and private research organisations (or SME’s) can take part in international programmes like EUREKA or IMS (Intelligent Manufacturing Systems) which are financially supported by the Innovation Promotion Agency (CTI)<sup>13</sup>.

In the space sector, Switzerland has increased its support to the ESA Prodex Programme which finances the development of space experiments and instruments in public laboratories and in industry (mainly SME’s). In Switzerland, public and private researchers are supported via the programme Spacotech of the Innovation Promotion Agency (CTI).

### **3. Government support for private-sector R&D and innovation**

#### ***Tax treatment of business R&D***

Switzerland offers no tax credits for business R&D. However, with a reform of business tax law launched in December 2003, tax reduction for risk capital is planned with the aim to foster entrepreneurial investment.

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<sup>13</sup> The Innovation Promotion Agency is a unit of the Federal Office for Professional Education and Technology (OPET) and also referred to as Commission for Technology and Innovation (CTI).

### ***Direct public funding of business R&D and innovation***

Direct funding of business R&D has no tradition in Switzerland. For the period 2003-2007, CHF 35 million have been provided for innovation and co-operation in the tourism sector. Direct support of SME's is possible in international or transnational programmes (e.g. the FP6 of the EU, the cross national programme "Interreg III").

### ***Public procurement policies***

A new directive published in June 2002 concerning public procurement allows firms of the EU and the EFTA-states to apply for public tenders in Switzerland and vice-versa.

### ***Efforts to attract R&D investment by foreign-owned firms***

There are no specific efforts to attract foreign companies. Of course, these companies can profit from measures offered to Swiss-owned companies such as the FP6 of the EU or the initiatives of the Innovation Promotion Agency (CTI).

### ***Support of venture capital or other sources of private sector financing***

Access to venture capital and private sector financing has considerably improved during the last years and should not be in any case an obstacle. However, access to seed money or early stage money still remains difficult in certain cases.

Within its programme "CTI-start up", the Innovation Promotion Agency (CTI) awards special labels to new companies. This label ensures that independent experts have checked business plans, and that young entrepreneurs have got a coaching. For the labelled start-ups, it is much easier to get early stage financing.

### ***Changes in IPR regimes***

The partial revision of patent law in Switzerland is ongoing. The focus of this patent law revision is the patentability of inventions in biotechnology. In December 2001, the Federal Council decided to open the hearing regarding the preliminary draft of the partial revision of the patent law. The focus of the partial revision was to conform the patent law with EU guidelines (EU directive) on the legal protection of biotechnological inventions in order to provide uniform and clear principles. The Federal Council launched a public discussion on the controversial issue of patenting biotechnology inventions with a broad consultation on the revision of the patent law at the beginning of 2002. The finalization of the patent law reform is expected for 2005.

On July 1<sup>st</sup>, 2002, a new design law for Switzerland came into force.

### ***Other forms of public support for innovation that use instruments other than R&D***

Within the comprehensive frame of the federal strategy for an information society, several projects and activities have been launched that may have an impact on private sector innovation.

Different legislations for the extension of e-commerce have been prepared (e.g. for e-signature or e-banking). Several e-government projects are on their ways. They simplify the contact with the administration for private firms (e.g. for tax-issues, web-information for start-ups and SME's, internet-services of regional and cantonal administrations, e-services for protection of trademarks).

As early as 1996, the Innovation Promotion Agency (CTI) started to offer a coaching service for young scientists at universities, universities of applied sciences and the ETH who want to start a company (CTI start up). In the period 2004-2007, the federal government will spend CHF 37 million, compared to CHF 10 million for 2000-2003. A pilot-project with the same aim (“Create Switzerland”) was launched in 2002 at the ETH Lausanne, with the support of the OPET.

Major reforms that may take place in the coming years in regional policies could have an impact on private sector R&D. As a follow-up of an evaluation performed by an OECD expert-group<sup>14</sup> and a report of national experts<sup>15</sup>, the new regional policy will probably no longer focus on equalising transfers between regions, but on the support of regional centres for innovation and entrepreneurship.

#### **4. Enhancing collaboration and networking among innovating organisations**

##### ***Initiatives to promote collaboration and networking among private firms***

In 2003, a pilot-study was carried out to examine the setting-up of an internet-based technology platform to provide transparent information for private companies on new technologies or specific knowledge, and to foster co-operation and networking between private and public partners. A central objective of the initiative is the improvement of technology transfer between public research institutes and private companies, and knowledge transfer between private companies.

Another newly introduced platform is [www.swissbiotech.org](http://www.swissbiotech.org). Its goal is to bring together important actors, such as private companies, public research laboratories, training institutions and organisations providing financing or public support. Furthermore, the platform serves as an international marketing instrument for Swiss biotechnology.

##### ***Policy initiatives to promote stronger industry/science relations***

Several measures have been taken to improve technology transfer at public research organisations (see also 4.1). In the revised law of the federal institutes of technology (ETH), technology transfer, the utilisation of knowledge and public relations were added to the mission statement.

The technology transfer offices of universities, of universities of applied sciences and of the federal institutes of technology have founded an association (SwiTT) with the aim to enhance knowledge exchange between them, to continuously educate people working in technology transfer and to improve framework conditions for technology transfer.

The Swiss Network for Innovation, founded in 1999 and financed by federal agencies to support tertiary education institutions in their technology transfer activities, could not perform as efficiently as expected because of several structural and organisational problems. It laid down its activities in 2003.

The Innovation Promotion Agency (CTI) provided extra money to finance joint R&D projects of industry and universities of applied sciences (UAS). Extra resources were offered for the coaching of researchers, for the establishment of centres of competences and the review of research projects at the UAS

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<sup>14</sup> Published in 2002 and available in English at <http://www.seco-admin.ch/imperia/md/content/standortfoerderung/regional-undraumordnungspolitik/43.pdf>.

<sup>15</sup> Published in 2003 and available in German at <http://www.seco-admin.ch/imperia/md/content/standortfoerderung/regional-undraumordnungspolitik/63.pdf>.

with the objective to strengthen the research competences at the newly formed UAS and to promote the relationship between industry and science.

### ***Reform the rules governing ownership and licensing of publicly-funded research results***

With the revised law of the federal institutes of technology, clear rules are given for IPR. The revised law states that ownership of intellectual property (except copyright) arising from work within the ETH domain belongs to the respective organisations. The researchers will get an appropriate share of the profit arising from commercialisation. The revised law also gives the right to the organisations to take interests in private firms that commercialise their research results. Through these rules, the legal framework for technology transfer has been improved for some of the most important players in public research in Switzerland.

### ***Increase the mobility of human resources between public and private sectors***

Activities in this field are largely left to the initiative of individual scientists and companies. The last two years have seen a few isolated examples, most notably at the Zurich Neuroscience Centre (agreements with the pharmaceutical industry which includes the possibility of temporary exchange of personnel).

### ***Set up new modes of public/private partnership for research and innovation***

One important project for public-private partnership was launched within the information society strategy of the government. With the objective “ICT to learn” and “learn ICT”, the cantons, the federal government and private firms will work together to increase ICT-competences in schools (public private partnership – “Schule im Netz”). For 2002, the estimated costs were CHF 320 million. The financial contribution of the federal government is small (CHF 3,3 million in 2002). The bulk of the funding is provided by private firms and the cantons.

## **5. Human resources for S&T**

### ***Recent statistics on science and engineering graduates from universities, and efforts to increase numbers of university graduates with science and engineering degrees***

The most recent data on graduates of Swiss universities and universities of applied science are from 2002<sup>16</sup>. The statistics show that, compared to 2001, fewer students graduated in science and engineering at universities in 2002. At the newly founded universities of applied sciences, the number of graduates in relevant fields (construction sciences, chemistry, technical sciences) was almost equal in 2002 and 2001 but increased compared to 2000. The overall number of students increased in both types of universities because of large increases in the fields of social sciences, humanities and economics.

### ***Improving public understanding of science***

In 1998 the foundation “Science et Cité” started its work. Its mission is to encourage public debate about and with science, and to produce a climate of critical trust between the scientists and the public. For the years 2002 and 2003, the foundation focused on initiating an informed debate about stem cells, globalisation and climate change. The federal state supported the foundation with CHF 5.5 million in the years 2000-2003, for the period 2004-2007 around CHF 7.8 million are planned.

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<sup>16</sup> See [http://www.bfs.admin.ch/stat\\_ch/ber15/donbas\\_hsw/studbas\\_d.htm](http://www.bfs.admin.ch/stat_ch/ber15/donbas_hsw/studbas_d.htm).

In addition, several communication departments of universities and institutes of technology have improved their web sites and adopted a more "aggressive" way of publicizing scientific achievement. For example, the victory of the boat *Alinghi* in the America Cup was extensively and successfully used by the Federal Institute of Technology in Lausanne to promote research done at several of its departments that cooperate with the *Alinghi* team. More recently the universities of Basle, Berne and Zurich have opened a common web site<sup>17</sup> devoted to science and research.

The Centre for Technology Assessment of the Swiss Science and Technology Council has carried out a number of so-called consensus conferences to evaluate public acceptance of new technologies.

Finally, the four scientific academies launched several projects to improve the public understanding of science. This special mission of the academies is also stressed in the ERT-message 2000-2003.

### ***Revising higher education curricula and expanding interdisciplinary training***

The Swiss University Conference has decided to introduce a bachelor-master-system in all Swiss universities and universities of applied sciences until 2010, as planned in the Bologna-Declaration. A central aim of this reform is a national and Europe-wide comparable system of graduation and performance, and an encouragement of students' mobility. Furthermore, the reform envisages the improvement of the quality of the courses at universities and the establishment of a framework for life-long learning and interdisciplinary studies. Several Swiss universities have already introduced the new system.

### ***Reducing the gender gap in science education and enhancing incentives for PhD study and post-doctorate training***

In 2000, the Swiss University Conference published a federal programme on equal opportunities for men and women at universities. The main objective of the programme is the doubling of the number of female professors at Swiss universities by 2006 to 14%. Three priorities for action have been envisaged: special incentives for universities to appoint female professors, a mentoring system for young female scientists, and special offers for childcare at universities. On this programme, the federal government will spend about CHF 20 million in the period 2004-2007.

The SNF has also launched programmes or has revised regulations in existing programmes to specially encourage females to pursue an academic career (e.g. Marie-Heim-Voegtlin programme for female post-docs and PhD-students, abolition of age limits for female applicants, possibilities for part-time work within SNF-projects).

Several programmes to reduce the gender gap have been initiated on the level of universities, universities of applied sciences and in vocational training thanks to federal funding. In vocational training projects, a minimal standard concerning gender aspects is required, and projects with special focus on this aspect get priority in funding.

At the universities of applied sciences (UAS), a special programme on gender aspects started in 2000. In the years 2000-2003 the federal state provided CHF 10 million for special projects. One project established new positions for delegates dealing with the issue of gender equality. The programme will be continued in 2004-2007.

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<sup>17</sup> <http://www.scienceportal.ch>

To enhance incentives for PhD studies and post-doctoral training, the Swiss National Science Foundation (SNF) offers grants for young talents in its general programmes or in relation with thematic priorities (e.g. in medical sciences).

### ***Policy initiatives taken to address perceived shortages of scientists and engineers***

Switzerland has a low percentage of people holding a university degree; however it has always had a high standard in professional education (apprenticeship). Starting in 1996, former schools for higher professional education were upgraded to universities of applied sciences (UAS). In the starting phase, seven UAS were temporarily permitted to run their schools till the end of 2003. In the meantime, they have been evaluated (self-evaluation, peer review, meta evaluation) and given time for further improvements of their performance and strategies. On 15 December 2003, the Federal Council granted permanent status to the seven institutions, including several schools providing tertiary education for engineers. Additionally, the law on UAS was revised, so that professional education in health care, arts and social work can also be integrated in the UAS system.

### ***Policy changes related to the international migration and mobility of scientific and high-skilled personnel***

The bilateral agreements between Switzerland and the EU have led to some simplifications in the mutual recognition of degrees and in the mobility of work-force between the EU and Switzerland. With Switzerland now fully associated to the FP6 of the EU, Swiss researchers will also be able to benefit from the mobility programmes of the EU, and foreign students and researchers will be encouraged to study and work in Switzerland. Besides the EU, Switzerland has signed several agreements on research exchange with other countries (e.g. China, Russia, India).

Switzerland has science counsellors in several countries who, among other tasks, promote the mobility of researchers. In 2003, the second Swiss house for co-operation in technology and research was founded in the US, located in San Francisco.

On the national level, the Swiss National Science Foundation (SNF) offers professorships for young researchers to set up their own research group in Switzerland. Since 1999, 102 professorships have been granted and 30% of the candidates were young researchers that applied from abroad. Furthermore, the SNF offers fellowships for researchers to spend time abroad.

Finally, Switzerland participates actively in the fellowships programmes of the European Molecular Biology Organisation (EMBO) and of the Human Frontier Science Programme (HFSP).

## **6. Policies to boost innovation in the service sector**

### ***Efforts to encourage service-sector firms to undertake more innovation and/or R&D***

As already mentioned in section 3, Switzerland has no tradition in direct financial support for research at private companies. There is however a support programme for the tourism sector (CHF 35 million in 2003-2007) to further innovation and co-operation.

### ***Efforts to encourage start-up firms in the service sector***

There is no special programme for start-ups in the service sector; however, the “CTI Start up” of the Innovation Promotion Agency (CTI) will also offer its services to the service sector (see 3.1).

***Programmes to increase the uptake of knowledge-intensive service activities (KISA) by service-sector firms or to increase demand for such services in the manufacturing sector***

Between 2000 and 2003, a special programme called Softnet was carried out with the aim to build up a software industry of international standard through co-operations between science and industry, through fostering of networks of competence, and through education of professionals in ICT. One additional task of the project was the development of standards for online commerce. The federal state financed the programme with CHF 30 million.

***Efforts to improve human capital through new educational curricula, support for on-the-job training***

Starting in 2004, Switzerland will have a new legislation concerning professional training. In particular, the new law will lay the basis to provide Swiss-wide uniform education standards in health care, social work and arts, and it will create new diplomas for professional training in information technologies. In the field of ICT, a dedicated working team published a report with recommendations for new curricula and degrees, as well as for a modularisation of the education in ICT.

***Deregulation, labour market reforms, support for standards or other policies to enhance competitiveness in the service sector***

A special law for the liberalisation of the electricity market was refused in a referendum in 2002, but new legislation allowing more market mechanisms to operate in this sector are planned. The telecommunication market was already opened in 1998. With new legislation in the fields of telecommunications, radio and television, a further step towards deregulation in these sectors is envisaged.

***Policies to enable service-sector firms to better protect, trade or value their intangible assets***

New legislation concerning electronic signature, domain names and copyright for online-services has been prepared or has already been passed, and will guarantee more legal security in these matters.

***Policies to promote use of open standards***

Open source software is already used to some extent within the public administration. The evaluation of advantages and risks of free and open source software for public purposes is part of the ongoing work of a group in charge of ICT-strategy in the federal administration.

## **7. Policy evaluation**

***Recent changes in policies regarding the evaluation of innovation policy programmes or institutions***

*Legislative or regulatory changes requiring evaluation*

According to Article 170 of the Swiss Constitution, the The Federal Parliament shall ensure that the effectiveness of measures taken by the Confederation is evaluated. This task has been specified in the new law on Parliament<sup>18</sup>.

Article 27 of this law attributes the obligation to ensure evaluation to all parliamentary institutions. The Parliament can require that the Federal Council mandates evaluations, it may control their quality, or it may mandate evaluations itself.

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<sup>18</sup> The law came into effect on December 1<sup>st</sup>, 2003.

Article 141 of the law on Parliament states that legislative or regulatory changes proposed by the Federal Council have to be accompanied by a report (so called „message“) that gives information about the impacts of new legislation in various fields, for example, on society, economy and the environment, on the equal treatment of men and women and of its general costs and benefits. With this new article, ex-ante evaluation becomes more important for policy elaboration in Switzerland.

*Requirements for evaluation of different elements of innovation policy: researchers, institutions, programmes, overall policy directions, innovation system*

For systematic evaluations, no organisational structure has been established. Competences for this kind of work are spread between different ministries, and within the ministries in different offices and agencies. People in charge of evaluation within the federal administration are loosely coupled in a network.

*Methodologies employed in evaluations at different levels*

As already mentioned above, several bodies within and outside the administration perform evaluations. Methodology is not uniform, but many institutions follow the guidelines of the Swiss Evaluation Society<sup>19</sup>.

The most important organisation for performing evaluations at an international level in Switzerland is the OECD (see, for instance, the evaluation of tertiary education in Switzerland which was finished in 2003).

Evaluations of horizontal policies and programmes have become more popular in the Swiss policy-making system (for example, an evaluation of federal measures concerning information society was conducted by the Center for Science and Technology Studies (CEST) in 2002<sup>20</sup>).

Besides evaluation, controlling is an instrument that was just recently introduced on a broad scale in the federal administration. The Federal Council decided to establish a system of quantitative indicators as a tool for governance, covering a broad spectrum of policy fields including also those related to innovation policy. The pilot project starts in the years 2003-2007. A similar exercise concerning the universities and the universities of applied sciences was conducted for the Finance Committee of the Parliament in 2003, to give an overview about performance and costs of this part of the tertiary education and research system.

*Efforts to ensure that results of evaluations feedback into policy development*

Already at the end of 2003, a process to evaluate the outcome of the ERT-message 2004-2007 was started, with the goal to provide background information for the formulation of the next ERT-message that will be issued by the end of 2006.

The right timing of major evaluations performed during the last years (see 7.2) allowed the consideration of their results in the policy process (the evaluation of the ETH domain was important for the drafting of its performance mandate, and the preparation of the ERT-message could benefit from the results of the evaluations of the SNF and of the Innovation Promotion Agency (CTI)).

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<sup>19</sup> The standards are available in English at [http://www.seval.ch/en/documents/SEVAL\\_Standards\\_2000\\_en.pdf](http://www.seval.ch/en/documents/SEVAL_Standards_2000_en.pdf).

<sup>20</sup> The report is available in English at [http://www.cest.ch/Publikationen/2002/CEST\\_2002\\_5\\_e.pdf](http://www.cest.ch/Publikationen/2002/CEST_2002_5_e.pdf). In addition, the Center for Science and Technology Studies (CEST) conducted comprehensive evaluations of some extra-university research institutions.

### *Information about the outcomes of recent major evaluations of R&D or innovation policies*

The Swiss Science and Technology Council (SSTC) is the advisory body of the Federal Council for science, education, research and technology policy matters. At the request of the Federal Council, the SSTC performed evaluations of the two major research-funding bodies, namely the Swiss National Science Foundation (SNF) and the Innovation Promotion Agency (CTI). Both assessments were finalized in 2002<sup>21</sup>. The experts compiled a list of recommendations.

For the Swiss National Science Foundation (SNF), the major recommendations were:

- Doubling of government support over the next four years and emphasis on investigator-initiated projects
- More effective use of its competence to device and implement new science policies
- Reforms in the governance of the SNF to strengthen the scientific leadership
- To make peer review international whenever feasible
- Restructuring of the decision making process and improving its transparency

For the Innovation Promotion Agency (CTI), the major recommendations were:

- Doubling of government support over the next four years and a shift to more “discovery-oriented” projects
- Creation of management support teams within the start-up programme
- More co-operation between CTI and SNF
- Improving accountability and quality control

In 2002, the OECD performed a review of Swiss tertiary education policies that was published in 2003. The evaluation took place in the midst of major reform processes in the Swiss tertiary education system<sup>22</sup>. The major OECD recommendations were:

- A better nation-wide co-ordination of tertiary education policies
- Despite of positive steps to grant more autonomy to individual institutions, further incentives should be established to encourage innovation in management and to strengthen competition
- To establish a knowledge base of statistical data concerning tertiary education and the foundation of an institute for tertiary education research

In 2002, international experts evaluated the ETH domain<sup>23</sup>. The evaluation included an assessment of the six organisations of the domain with regard to the objectives of their performance mandate 2000-2003

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<sup>21</sup> For further information see [http://www.swtr.ch/swtr\\_en/evaluation\\_snf\\_kti.htm](http://www.swtr.ch/swtr_en/evaluation_snf_kti.htm).

<sup>22</sup> For further details see the Swiss contribution to the OECD Outlook 2002 available at <http://www.oecd.org/dataoecd/46/50/2765813.pdf>.

and an assessment of the activities of the ETH Board. The overall results were very good. Major recommendations were:

- Stable funding
- Worldwide recruitment of personnel
- Education according to the Bologna process and establishment of PhD programmes and graduate schools
- Strengthening and restructuring of some research programmes
- Strengthening the activities in the area of technology transfer

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<sup>23</sup> For the report of experts see [http://www.gwf-gsr.ch/deutsch/national/peer\\_committee.pdf](http://www.gwf-gsr.ch/deutsch/national/peer_committee.pdf)