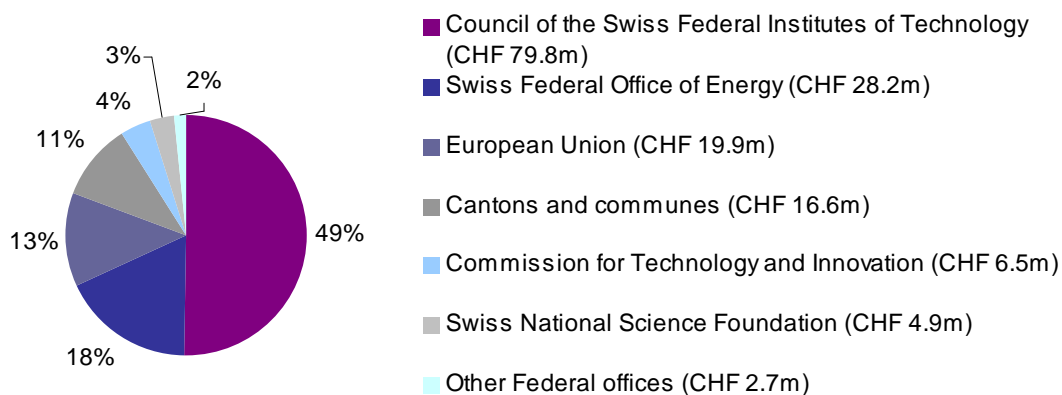




Management of energy research financed by the Swiss Confederation Evaluation of priority setting, fund allocation and of coordination

Key facts

Research is one of the main elements of Switzerland's energy policy. It makes a valuable contribution towards achieving a guaranteed energy supply and a reduction in CO₂ emissions. Between 1992 and 2005, Switzerland has seen a reduction in public funds allocated to this area of research. There was a drop of CHF 64 million in research spending. The public authorities are currently investing approximately CHF 160 million a year (average amount for the period 2004-2005):



This public funding is supplemented annually by private sector investments of an estimated CHF 740 million. Thus, research projects are financed by numerous stakeholders. It is therefore in the interest of the Swiss Federal Audit Office to examine how energy research is managed by the Confederation. For this purpose, the Swiss Federal Audit Office has evaluated the processes for priority setting, fund allocation, and coordination among the various stakeholders. Along with a documentary analysis and semi-structured interviews, three case studies were carried out in the fields of photovoltaics, building and nuclear fusion. A comparison with the practices applied in Germany and the Netherlands completes the analysis.

A structured process for setting priorities

The *Swiss Federal Energy Research Master Plan 2008-2011* sets out the priorities for the period 2008–2011. Since 1984, it has been updated every four years by the Federal Energy Research Commission (CORE). These priorities include topical key points and recommendations regarding the budgeted amount of public expenses.

The priorities for 2008–2011 are determined in a structured manner. Priorities are identified on the basis of precise criteria while taking into consideration experiences observed in other countries.

The Swiss Federal Office of Energy has developed individual programmes for each of the 24 research subdivisions, e.g. photovoltaics, energy use in buildings, or nuclear fusion. The programme leaders, together with the office's division leaders, are in charge of asking the Federal Energy Research Commission to update the priorities relevant to their own programmes. In most pro-

grammes, the re-examination of priorities includes an extended follow-up – in the form of follow-up working groups or workshops.

Comprehensive and consensus-based priorities

Due to their comprehensive character, the established priorities are bound to conform to the Federal Council's energy objectives, which stipulate that Switzerland must strive to achieve the so-called 2,000-watt-society and reduce its annual CO₂ emissions to one ton per capita.

Compared to the Netherlands, the established priorities are rather general, which is due to their consensus-based character. With the exception of coal and oceanic research, no subject has been entirely excluded. Key points within each programme have been determined. In Germany, the same approach has been chosen, although the public funds invested in research are considerably larger than in Switzerland.

The contact persons vis-à-vis the Swiss Federal Audit Office express general support for the priorities defined for the period 2008–2011. There are, however, differences of opinion regarding the following aspects, although it was not possible to identify a clear trend:

- a) funding of nuclear research;
- b) whether to focus on the needs of energy policy or of the economy or, on the contrary, on those of academia (in Switzerland, the priorities defined for the period 2008–2011 take all three spheres of interest into account, while in the Netherlands, the focus is clearly on the research requirements of the economic sector);
- c) the more exclusionary priorities: based on the position expressed by the International Energy Agency (IEA) and as a result of limited public funds, the Swiss Federal Audit Office considers it appropriate for Switzerland to shift its focus to somewhat more exclusionary priorities, as it is difficult for a small country to finance research projects in a large number of technologies and at the same time expect major progress (other small countries have adopted successful strategies by focussing their research funding on a small number of key areas, where they can benefit from natural resources and/or other advantages, e.g. ocean energy in Portugal or biomass in Finland).

Priorities systematically applied by the Swiss Federal Office of Energy only

The Swiss Federal Office of Energy is the only authority to have systematically considered the key points of the Energy Research Master Plan in its processes. The other funding institutions, having different objectives as well as their own individual funding system, do not have to apply these priorities.

The three types of research institutions in Switzerland – polytechnic schools, cantonal universities, and specialised universities of applied sciences – receive basic institutional financial support which needs to be supplemented by third-party funding not dependent on the application of the priorities defined within the Energy Research Master Plan. However, the energy research strategies of the Domain of the Polytechnic Schools do largely take into account the priorities defined by the Federal Energy Research Commission as the Domain is well represented in the Commission.

The Energy Research Master Plan and its priorities have not had a direct impact on the creation of competence centres at polytechnic schools. However, the priorities have at times been taken into account during the establishment or refocusing of some laboratories and "centres of excellence" in

a particular research domain. This was largely thanks to communication efforts made by both the Federal Energy Research Commission and the Swiss Federal Office of Energy and to funding by the Swiss Federal Office of Energy.

A satisfactory process for fund allocation ...

Public funds are allocated in a diversified manner. The application examination and decision-making processes at the Swiss Federal Office of Energy, at the Commission for Technology and Innovation, the Swiss National Science Foundation, or the Competence Centre for Energy and Mobility are satisfactory. The project selection criteria are being both published and applied. Groups of experts are formed to avoid a concentration of powers, thus ensuring the decision-makers' independence. The selection procedure is documented. However, in the eyes of the Swiss Federal Office of Energy, there is still room for improvement.

... favouring funding of quality projects

The Swiss Federal Audit Office did not analyse the scientific quality of the projects. The selection of quality projects is favoured by competition among the applications and the decision-makers' expertise. The Swiss Federal Office of Energy does not systematically encourage competition among the applications when assigning research mandates.

When research institutions finance projects with third-party funds, these projects are subject to an external evaluation by the funding institutions.

A clear and well appreciated sharing of tasks among the funding institutions

There is sufficient coordination among the energy research stakeholders. As for the funding institutions, there is a clear distribution of tasks and responsibilities among institutions, researchers, and the private sector.

The current distribution is appreciated, as it prevents research from being subordinated to a « unitary doctrine », and because it allows to benefit from the complementarity of the funding institutions. The main disadvantage is the tendency to allocate a large number of small amount subsidies, which in turn increases administrative costs and coordination work. Nevertheless, these charges are still moderate when compared to international cooperation projects.

A sought-after and well-organised exchange of information

Both the Swiss Federal Office of Energy and the Federal Energy Research Commission play an important role with regard to the exchange of information between the numerous public and private stakeholders in the area of energy research both in Switzerland and abroad. The exchange takes place within the framework of formal contacts and, in a less formal manner, at the level of individual research projects, in which case quality depends largely on the personal commitment of the programme managers at the Swiss Federal Office of Energy and the desire for cooperation among researchers and private stakeholders.

Low-key supervision in which the Swiss Federal Office of Energy plays a pivotal role

Compared to practices in the Netherlands, supervision in Switzerland is rather low-key. The defined priorities are quite broad and supervision is carried out by the Swiss Federal Office of Energy mainly in terms of its financial resources (approximately one-fifth of total public spending, not including expenses relating to the European Euratom programme).

The efforts made by the Swiss Federal Office of Energy and the Federal Energy Research Commission in terms of information exchange and committee participation should not be underestimated. They, too, contribute towards implementing the given priorities and thus towards research management. In comparison to other countries, Germany seems to come closer to the Swiss approach. The Dutch system is characterised by its strong supervision, a considerable share of public spending being specifically earmarked for the implementation of the country's energy strategy by the intermediate state energy agency. Also, this strategy results in somewhat more exclusionary priorities.

Room for improvement and recommendations

The results of the analysis carried out by the Swiss Federal Audit Office were positive. However, some room for improvement was identified, resulting in the following three recommendations:

1. With regard to the Confederation's Energy Research Master Plan for the period 2012–2015, the Swiss Federal Audit Office recommends that the Federal Energy Research Commission should:
 - a. increasingly focus its priorities on the areas most important to the country in terms of its energy policy requirements, taking into account the fabric of the economy and the academic capacities;
 - b. clearly state which areas are not considered a priority;
 - c. distinguish between the financial commitment expected from the Swiss Federal Office of Energy and other sources of public financing.
2. The Swiss Federal Audit Office recommends that the Swiss Federal Office of Energy systematically apply the principle of competition when allocating research mandates.
3. The Swiss Federal Audit Office suggests that the Swiss Federal Office of Energy adopt a consistent approach to evaluating and selecting applications for all its research programmes. Such a process must be systematically documented.

The Federal Energy Commission and the Swiss Federal Office of Energy both appreciate the recommendations of the Swiss Federal Audit Office and will take the appropriate action for their implementation - as far as this has not yet been arranged for. The statements of both institutions can be found at the end of this report (appendix 7).

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