

# Energy for the Swiss



# "A healthy environment is also good for the Swiss economy"



Walter Steinmann, Director of the Swiss Federal Office of Energy (SFOE), talks about new directions in energy policy and the main objectives for the coming years.

## Mr. Steinmann, in the past half century Switzerland's energy consumption has increased by a factor of more than five. What are the reasons?

Walter Steinmann: The main reasons are as follows: a higher standard of living, ever greater mobility, and the fact that up to the 1980s economic growth went hand in hand with greater demand for energy.

## What are the dangers for Switzerland if energy consumption continues to grow?

Many countries look forward to closing the development gap with the industrialised world and can therefore be ex-

pected to consume more energy in the future. This could lead to higher prices. At the same time Switzerland would become more dependent on the energy producers, since most of the energy we consume is produced elsewhere. And of course the environmental pollution that results from the production and consumption of energy in its various forms is a real menace to us all.

## Which is most important: to consume less energy or to switch to renewable forms of energy?

In the years ahead we shall increasingly focus our attention on improving energy efficiency. We also need to reduce our consumption of energy. The new renewable forms of energy must be given a better chance in future. Their usefulness in the short term however tends to be overestimated – the technologies currently available are not yet competitive. Their chances will improve considerably however in the long term.

## It is often said that energy is under-priced. How much more expensive should it be?

Energy consumption involves external costs which are not included in the price tag. It would be difficult however to transfer these costs fully to the energy consumer, since this would simply be unacceptable to the electorate. An effort will be made in the years ahead to introduce ecological incentive taxes, but this will be a slow process. The price of petrol is particularly sensitive in political terms. I am well aware of the fact that unlimited mobility is one of the sacred cows of our society.

## Action programmes such as SwissEnergy are of particular importance to the SFOE when it comes

## to implementing the federal government's energy policy. Do you think SwissEnergy has a good chance of success?

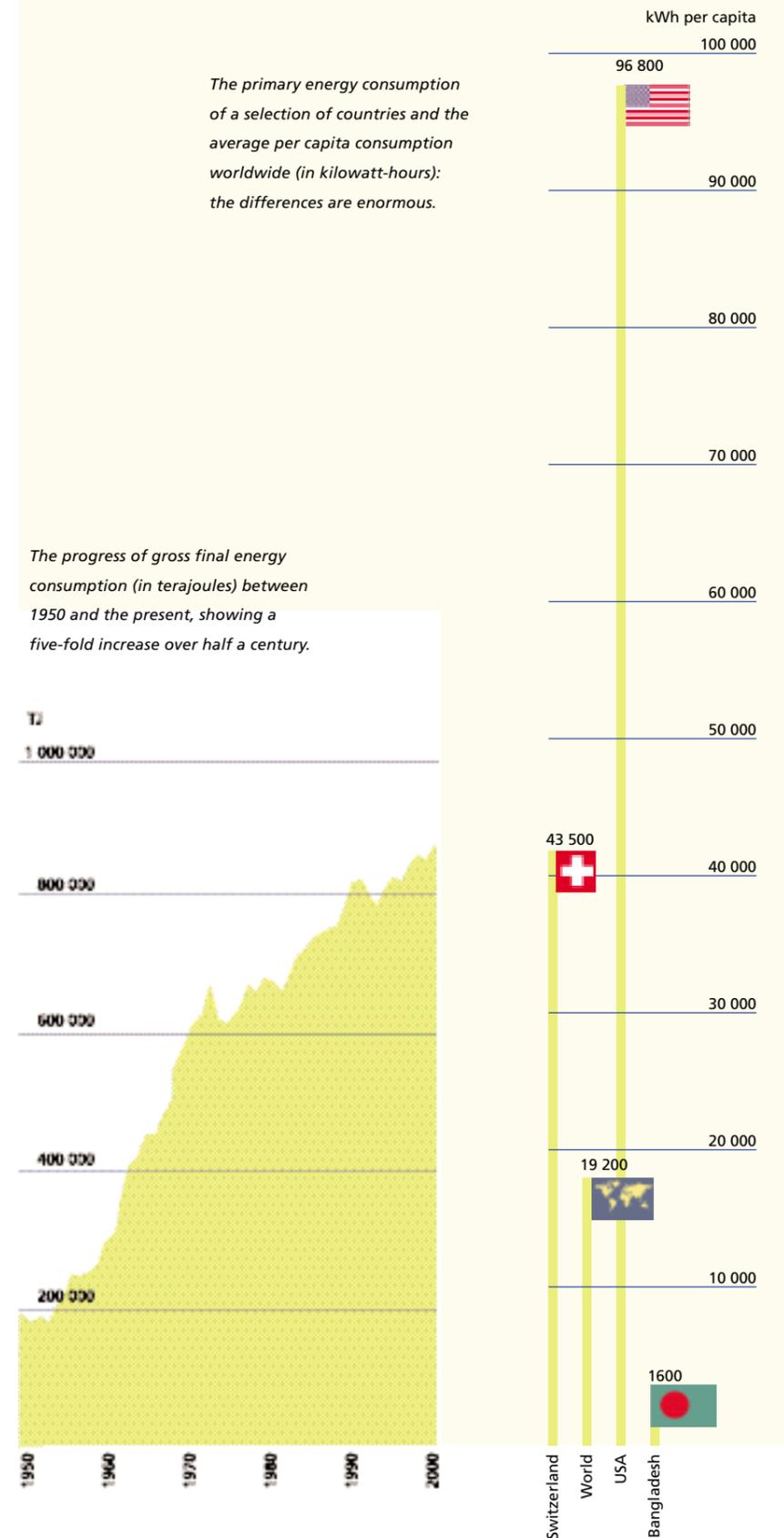
SwissEnergy is moving in the right direction. Programmes like this are important for providing information and influencing behaviour: they set an example to follow and help new technologies to get established on the market. Even so additional efforts will be required to achieve the government's CO<sub>2</sub> reduction objective.

## The SFOE is in a dilemma as to the best way to achieve results, whether through voluntary measures or by legal enforcement. How can this dilemma be resolved?

The key to the solution is co-operation. Efforts to co-operate with various players in the economy are already producing results. My experience shows that there is both openness and commitment, which is encouraging. It is important however that we move beyond mere good intentions. And there are differences of opinion in some areas. So we cannot exclude the possibility of having to resort to legal measures.

## Will the Swiss people welcome the change of direction in energy policy?

On the whole the Swiss people have a high level of awareness when it comes to energy and environment issues. Whether or not they are ready to accept the extra cost we shall have to see over the next few years. But a healthy environment is also good for the country, including the economy. In the long term neglecting the environment would have a very negative impact on Switzerland, notably on the tourism industry and the general quality of life.



# The pace of a new era

**The energy industry all over the world is on the move. The Swiss electorate's concern about security of supplies has blocked efforts to introduce more competition in the electricity and gas markets. But can this country function as an island onto itself in the energy sector?**



Ensuring that reliable supplies of energy can be obtained at reasonable prices is a matter not just for the economy but also for the government. The SFOE works with the cantons to ensure that all regions and segments of the population can depend on the security of electricity supplies. The importance of this issue was clearly illustrated by the rejection of the Electricity Market Law (EMG) by 52.6 per cent of voters on 22 September 2002. The public's fear that opening the market, even with clear guidelines, could have a negative impact, particularly on the public service aspect of electricity supply, was the downfall of the EMG.

## **Transit network through Switzerland**

Far from being an island Switzerland finds itself at the very heart of Europe in the energy field. As well as being a hub of Europe's transport network Switzerland is the central transit point for both electricity and gas. At present Switzerland exports considerably more electricity than it imports in the summer months. In the long term however our imports may have to increase, and this will require good economic relations with our neighbours. Following the defeat of the EMG the electricity supply industry has no choice but to move ahead. Efforts now underway must continue – investment in the grid systems, the introduction of modern cost accounting and greater emphasis on giving the customer what he wants. Switzerland must explore all avenues in its efforts to find the most promising

structures for the electricity and gas markets. Security of supplies and public service must be guaranteed by rules that apply on a national scale.

Natural gas is another competitive European industry, whose importance will grow in the future. The problem is less acute here than with the electricity market however, since there is already a certain amount of competition between heating oil and gas in Switzerland. Furthermore, unlike electricity Switzerland is totally dependent on imports for its supply of natural gas. But as with electricity so with gas, the time has come for all concerned parties to get together and discuss the basis of a new form of organisation. The SFOE will do its best to find solutions based on consensus.

Switzerland is not an island. Its natural gas and electricity markets need adaptive restructuring.



# In step with nature

Switzerland has set ambitious objectives for improving energy efficiency and promoting renewable forms of energy by means of the SwissEnergy programme. Despite promising interim results an enormous effort is still needed.

True. Switzerland still needs to make considerable progress on the road that will take us to a sustainable energy policy. Promoting greater energy efficiency is an indispensable part of this plan. Conventional sources of energy are particularly harmful to the environment. The sustainable energy policy of the future must therefore rely increasingly on forms of energy that are renewable.

The first measurable energy policy objectives were introduced at the beginning of the 1990s with the Energy 2000 Action Programme. Switzerland's goals in this context included stabilising the consumption of fossil fuels, achieving a significant reduction of growth in electricity consumption and increasing



renewables' share of both electricity generation and heating. Energy 2000 helped to reduce emissions of CO<sub>2</sub> and to economise much energy, creating jobs and stimulating investments. The Action Programme achieved its objectives, either completely or in any case significantly, with one important exception in the question of CO<sub>2</sub> reduction.

## Objective: a significant reduction in CO<sub>2</sub> emissions

The objectives of the SwissEnergy follow-up programme are even more ambitious in relation to both energy and climate. Consumption of fossil fuels is to be reduced to 10 per cent below the level of 1990 in the decade between 2000 and 2010. This also means a reduction of CO<sub>2</sub> emissions by 10 per cent for the 1990–2010 period (as required by the CO<sub>2</sub> law). Another objective is to hold growth in electricity consumption to a maximum 5 per cent, and hydropower production must at least remain at its present level. The contribution of other renewable forms of energy to electricity generation should



## Switzerland's ambitious energy and climate objectives are achievable only with legislative support.

increase further, the target being 1 per cent of the total, and in the case of production of heating energy 3 per cent.

The Programme is based on a wide-ranging partnership between the federal, cantonal and local authorities, the private sector, environmental and consumer organisations, covering all areas of consumption. Important SwissEnergy measures include the introduction of energy labels, for household appliances on 1 January 2002 and for automobiles on 1 October 2002, plus the energy town label scheme to encourage local authorities to adopt a sustainable energy policy.

Although the results to date are promising, further efforts will be required if Switzerland is to meet its international obligations under the Kyoto Protocol,

including legal measures. Indeed there is plenty of scope for improvement: the best new technologies now entering the market consume only 20 to 50 per cent of the energy required by models currently in use. And the economically useful potential of renewable forms of energy amounts to about 10 per cent of electricity demand, or 40 per cent in the case of heating. Energy today plays a subordinate role in the decision-making of most planners and investors, because it is not a significant cost factor. However the external costs of energy consumption, which are borne by the society in general, are estimated at between 11 and 16 thousand million Swiss francs per annum. It would be necessary to virtually double the current price of most conventional forms of energy to achieve anything like cost transparency.

# Safety is the leitmotiv

**In energy as in other fields the greatest priority must go to protecting the population and the environment, be it in relation to nuclear power, electrical installations or the high-pressure gas and oil pipelines.**

The production, distribution and utilisation of energy in all its forms involves risks. The public is not always fully aware of these risks. No one disputes the importance of safety for the operation of nuclear power stations for example, but how many people who depend on electricity at the workplace and in their everyday lives stop to think of the possible dangers?

Ensuring the proper protection of the population and the environment is the job of the federal authorities, who are responsible for the necessary regulations and authorisations, and for supervising the building and operation of installations of all kinds. It is the operators themselves however who bear direct responsibility for the safety of the production and distribution systems. Expert assessment of the technical

safety aspects is in the hands of three inspectorates that report to the Swiss Federal Office of Energy (SFOE), and ultimately to the Swiss Federal Department for Environment, Transport, Energy and Communication (UVEK). These are the Swiss Federal Nuclear Safety Inspectorate (HSK), the Swiss Federal High Voltage Transmission Lines Inspectorate (ESTI) and the Swiss Federal Pipelines Inspectorate (ERI).

## **Nuclear security has top priority**

The HSK is responsible for supervising and assessing Swiss nuclear installations from the point of view of safety and protection from radiation, and for all matters relating to nuclear waste products. It is also involved in the preparation of laws and ordinances in this field and issues suitable guidelines. This Inspectorate also provides the technical expertise in all matters to do with the safety of nuclear installations – their construction, operation and modification – as well as for geological testing of possible sites for the final storage of radioactive waste. It has the final say on any alterations that would affect the safety of nuclear installations. And it monitors and evaluates the operation of these installations by means of inspections, meetings with those responsible, as well as on the basis of regular reports submitted by the operators. The HSK keeps up with all developments in related sciences and fields of technology and both initiates and supports research projects in the area of nuclear safety. It frequently exchanges ideas and information with other national safety authorities and with the relevant

international organisations. The HSK keeps the general public and the authorities informed about all aspects of nuclear safety.

The Swiss Federal High Voltage Transmission Lines Inspectorate (ESTI) is responsible for the safety of low as well as high voltage installations. It has to check and approve all projects involving high voltage installations. As the low voltage inspectorate the ESTI determines what protective measures are required when low voltage systems, in particular communication networks, are to be linked to high voltage installations. At the request of the national accident insurance company (SUVA) it enforces accident prevention measures in the building and operation of electrical installations and is responsible for the investigation of accidents involving electricity. Another task is promoting safety in the operation of electrical installations in the private sector.

Ensuring the safety of high pressure oil and natural gas systems is the job of the Swiss Federal Pipelines Inspectorate (ERI), which examines all projects, informs the SFOE as the competent authority about the measures required before planning permission can be granted, and supervises the building and operation of pipelines and related infrastructure in accordance with the statutory norms.

The SFOE is also responsible for ensuring that in the coming years a satisfactory solution can be found for the disposal of Switzerland's radioactive waste. And finally it has the duty of ensuring that Switzerland meets its obligations under the Non-Proliferation Treaty and protecting nuclear installations and materials from sabotage.

The production, distribution and utilisation of energy are subject to strict controls.



# The authorities try to keep all in harmony

**Swiss energy policy has been subject to much heated controversy over the past few decades. The solutions that will have to be found must be able to satisfy a variety of conflicting interests.**

Swiss energy policy does not exist in a vacuum. On the contrary, it is the subject of intense dialogue between the authorities and a myriad of different groups which closely monitor all efforts to legislate in this field. The dialogue brings together the federal, cantonal and local authorities, the private sector, environmentalists and consumer organisations, among others. The debate about Switzerland's energy policy and "the right way forward" has been particularly intense since the mid-Seventies. In several cases the final decision has been taken at the polls on a very slim margin.

The debate on energy can be traced back to the oil crisis of 1973 when the price of crude oil skyrocketed, quadrupling in a matter of months and leaving the industrialised countries suddenly aware of their vulnerability and dependence on imported energy. Lively discussions on the future course of energy supplies have continued to this day. Switzerland found it needed to create the legal basis for a new national energy policy. A first attempt, in the form of an "energy article" to be added to the Swiss constitution giving clear policy guidelines, was defeated in 1983 by the opposition of a slim majority of the cantons. An energy article was finally adopted after a second attempt in 1990 when it mustered the support of 71 per cent of the electorate. The constitutional energy article requires the federal government and the cantons to ensure sufficient, diversified and secure supplies of energy in ways that are both economically and environmentally sustainable – and ex-



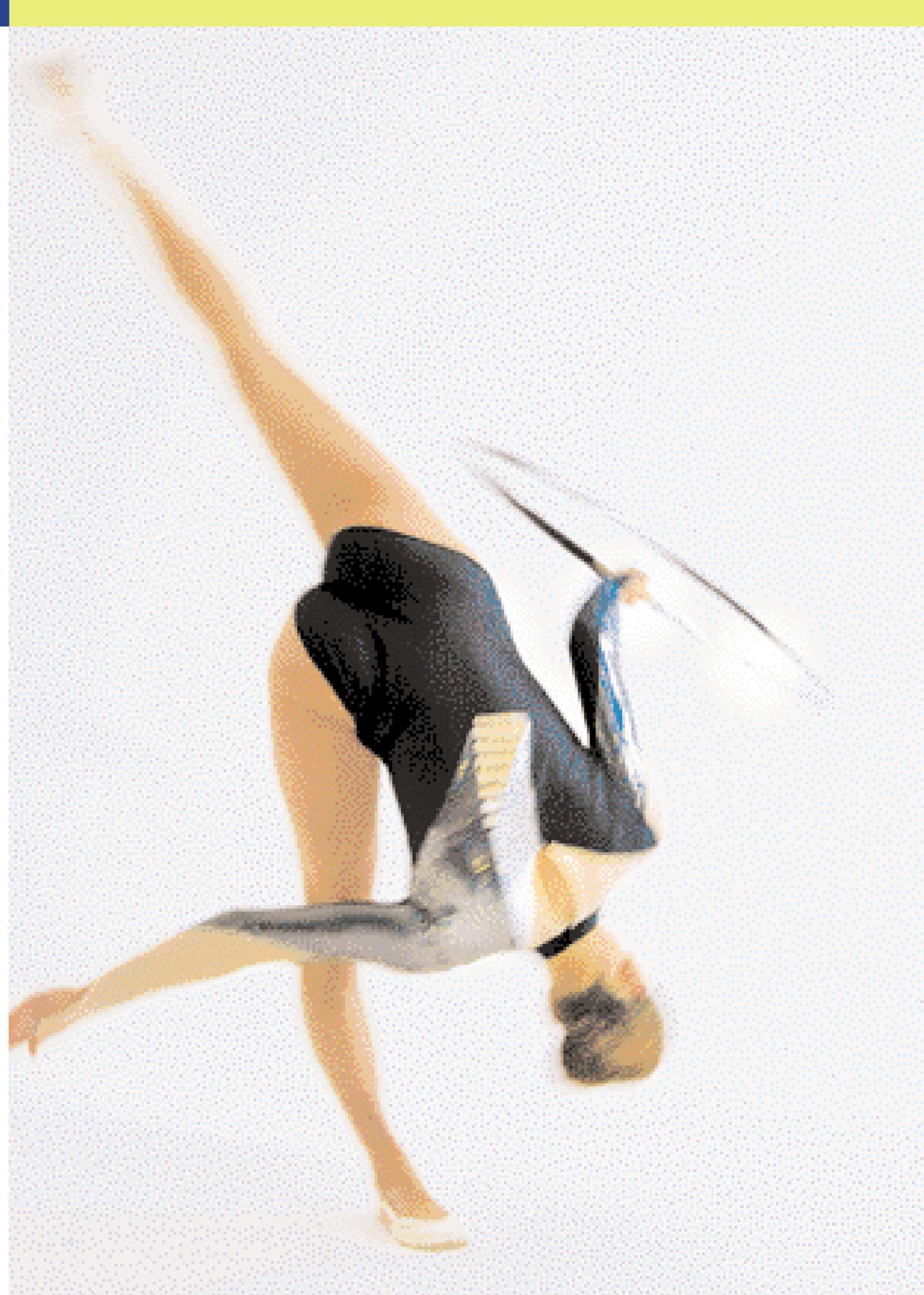
What kind of energy?  
The Swiss have been debating the pros and cons of energy supply options for decades.

PLICITLY calls for "efficient and sparing" use of available energy resources. A temporary decree was responsible for implementation of this policy, until on 1 January 1999 it was replaced by the federal law on energy and the energy ordinance. One of the main instruments of Switzerland's policy to promote sparing and efficient utilisation of energy and renewable forms of energy was the Energy 2000 Action Programme, launched in 1990 and in 2001 replaced by the follow-up programme entitled SwissEnergy.

## Problems at the implementation level

Another focal point of the energy debate is nuclear power, which has long been a subject of controversy. The nuclear accident that occurred at the Three Mile Island reactor in Harrisburg, Pennsylvania, in 1979, and the Chernobyl catastrophe of 1986, added fuel to the fire of debate in Switzerland. Popular initiatives calling for an end to nuclear power were rejected in 1984 and again in 1990. But on the latter date a 10-year moratorium was approved by the electorate. Swiss society has had a very difficult time ever since, trying to reach a consensus on the burning questions of nuclear energy, and what to do about radioactive waste.

The basic tenets of Swiss energy policy are enshrined in the constitution. But it is at the level of legislation that problems arise. The vote of September 2002 rejecting the proposed electricity market law and creating legal uncertainty in the electricity market is but the latest example. Cutting our way through the range of often contradictory options is a permanent challenge to Swiss energy policy and to those responsible for its implementation.



# The SFOE leads the dance

**The SFOE team, working closely with the political authorities, the private sector and other concerned organisations – using all the know-how at its command, and open to suggestions from any quarter – is constantly on the trail of optimum solutions for a sustainable energy future.**

The SFOE sees itself as the appointed trailblazer for Switzerland's sustainable energy policy. It is above all committed to bringing about a reduction in the consumption of energy – particularly non-renewable forms of energy – nationwide, at the same time encouraging research, development and application in the field of renewables, which it is hoped will eventually have a much larger share of the total energy mix.

The main lines of this policy were summed up in a report entitled "Strategy for sustainable development" issued on 9 April 1997, in which the Swiss government clearly states that sustainable development is the principal objective of all policy-making. Sustainable development thus became the guiding principle for all activities of the Swiss Federal Department for Environment, Transport, Energy and Communication (UVEK). Although sustainable development has become a "buzz word" in recent years, people are often unclear as to the real meaning of this concept. "Sustainable" development means development that will meet not just the requirements of the present generation but that takes equally into account the needs of generations yet unborn, in recognition of the fact that global resources are not available in unlimited quantities.

The three key elements of sustainability are as follows: environmental protection, economic efficiency and social solidarity. The principal task of the SFOE is to ensure that these three aspects are

**The SFOE path to sustainable development: teamwork, trust, mutual respect.**



fully integrated in all efforts to implement Switzerland's energy policy. This means making a special effort to balance the often conflicting demands of ecological wisdom, the requirements of the economy and the needs of society as a whole – including the all-important "public service" dimension.

The SFOE is fully aware that these objectives cannot be achieved through any diktat, but only through close collaboration with the cantons, local authorities, the public and private sectors and various representative organisations. The Energy Office hopes to achieve these objectives through teamwork and trust, in a spirit of mutual respect. The SFOE believes firmly in open dialogue, negotiation based on compromise, and each being ready to accept his responsibilities. The way forward is a learning process that requires both personal and professional development, constantly improving our "know-how".

The SFOE hopes to win the support of its partners and clients through relations based on trust, openness and uncomplicated dialogue, putting "state-of-the-art" know-how to work to implement a convincing energy policy. The only area in which the SFOE is not ready to compromise is the security of the population and of the environment, which must be the first priority in the production, distribution and utilisation of all forms of energy. Our attention to quality and security must be especially strict when dealing with nuclear installations, and the disposal of radioactive waste.



# Preparing the next leap forward

**Switzerland, together with the other industrialised nations, must learn to control its consumption of energy so as to forestall the possibility of an environmental catastrophe on a global scale. This is the ultimate objective of the research, development and promotion of new technologies supported and financed by the Swiss Federal Office of Energy (SFOE).**

The high level of energy consumption in the industrialised world is more than a threat to our present environment. It jeopardises the future of mankind by squandering resources that in the longer term will be impossible to replace. If the rest of the world begins to consume energy in the same careless way the impact on the environment will soon cease to be sustainable and end in catastrophe on a global scale. Since energy consumption in the underdeveloped regions of the world is certain to expand significantly in the next few decades, a radical change of policy is urgently needed. The world summits on the environment at Rio de Janeiro and Kyoto laid the basis for a change of

direction at the international level. As a new member of the United Nations Switzerland feels that it now has an even more important role to play in international efforts to find a solution, motivating other nations to share the burden. Significant progress is already being made at the national level thanks to the new CO<sub>2</sub> law and the Swiss-Energy programme. The aim of the CO<sub>2</sub> law is to reduce Switzerland's consumption of fossil fuels by the year 2010 to a level that is 10 per cent lower than in 1990. Ambitious as it is even this goal is only an intermediate step. In the next few years Switzerland will be setting new targets for the period beyond 2010. The scenario on which Swiss planning



**Developing and marketing new energy technologies: the state must support research efforts**

will be based is likely to reflect the philosophy of the "2000 Watt society". It would mean reducing Switzerland's annual CO<sub>2</sub> emissions from today's six tonnes per capita to just one tonne.

## **Support for research in the energy field**

The sustainable supply and utilisation of energy is inconceivable without improvements in current technology and the development of new technology. Energy-related infrastructures such as transport systems, buildings, industrial installations and power plants have a long life however. And entrepreneurs, who tend to focus on short-term profita-

bility and success in the market, are reluctant to invest in new or improved energy technology. The problem is aggravated by the fact that conventional energy is inexpensive. There are too few incentives to reduce energy consumption. It is up to the state therefore to assume an active role in the research and development of new energy processes and technology, and to promote these in the marketplace. The SFOE coordinates and oversees national energy research programmes that are financed through public funds. It also keeps an eye on the international dimension of such projects, and concerns itself with the most effective ways to use the results of research at the application level.

The SwissEnergy Programme is an important instrument in this context. The SFOE works closely with the universities, various institutes and the private sector to promote research in many fields. Public spending on research and development in the energy field amounted to SFr 173 million in 2001, of which SFr 36 million was channelled through the SFOE. Private sector spending is estimated to be four times as great.

The blueprint for SFOE allocation of research and development funds is a document entitled "The Swiss government's energy research concept". The emphasis of publicly funded research is on achieving more efficient use of

energy in buildings and in the transport sector, the development of technology for the transformation and storage of energy, and new renewable forms of energy and related technologies. The research also takes into account the economic, social and environmental aspects in each case. Other areas of research funded by the SFOE include the safety of Switzerland's existing nuclear reactors, the disposal of radioactive waste, and nuclear fusion technology, which in the distant future may prove an alternative source of electricity. All of these efforts have one thing in common: the desire to make Switzerland's energy supply more sustainable in the interest of future generations.



#### **The illustrations**

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#### **For additional information:**

- [www.swiss-energy.ch](http://www.swiss-energy.ch)
- Swiss Federal Office of Energy (SFOE), Facts & Figures
- A Flying Start, SwissEnergy 1st Annual Report 2001/02
- SwissEnergy: New energy in the wind
- Free subscription to "Energy Extra" providing essential SFOE energy news and info on the SwissEnergy programme, published six times each year in German and French
- Free subscription to ENET News – information on research in the energy field, published three times a year in German and French

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