

Zeitschrift: Energie extra
Herausgeber: Office fédéral de l'énergie; Energie 2000
Band: - (2004)
Heft: 3: [english]

Artikel: Renewable energy in Switzerland
Autor: [s.n.]
DOI: <https://doi.org/10.5169/seals-644035>

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SURVEY

Renewable energy in Switzerland

Plenty of hydropower, practically no fuel resources, resourceful minds – from its special situation, Switzerland has adopted an energy programme with a considerable proportion of renewable energy sources.

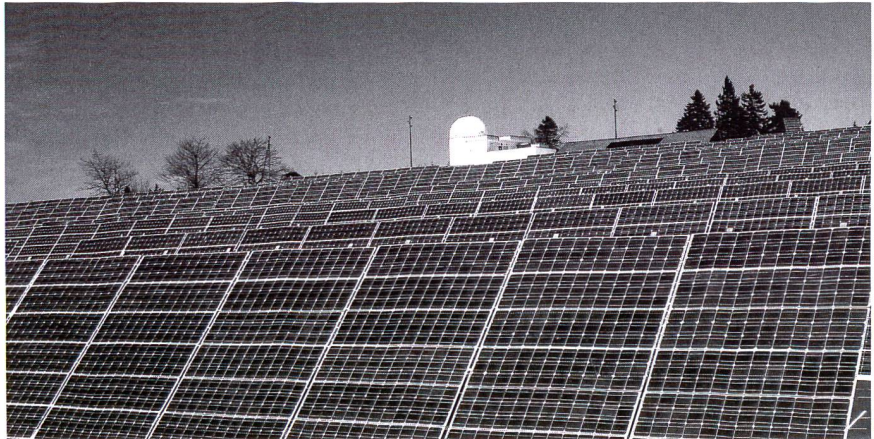
Switzerland decided very early to exploit its hydropower potential. Otherwise lacking fuel resources, it now ranks among the countries with the highest share of hydropower as a primary source of energy, although the potential is regarded as practically fully exploited.

So-called "new" renewable energy sources have registered some success since the beginning of the 1990s, but their potential is a long way from being fully exploited.

Waste combustion and biomass contribute the largest share to the use of the renewables. Switzerland is one of the world leaders in the deployment of heat pumps and photovoltaic capacity. Altogether, renewable energy sources (including hydropower) account for 21 percent of Switzerland's primary energy and around 60 percent of total production of electricity.

Switzerland exports 10 to 15 percent of its electricity generation as "clean energy" to neighbouring countries. Electricity companies increasingly offer certified "green" electricity, for which around 5 percent of consumers are prepared to pay more.

The solar energy plant on Mont Soleil.



Politics. A safe, efficient and environment-friendly energy supply as well as economic and rational energy consumption are constitutionally mandated in Switzerland (and reinforced by the Energy Law of 1998).

Acting in accordance with this constitutional mandate, the Swiss Federal Council launched the 10-year programme *Energy2000* in 1990. The target for electricity production from renewable energy sources was more than fulfilled by the end of this period, although the targets for heat generation were not quite reached.

The lessons from *Energy2000* were incorporated in its successor, the *SwissEnergy* programme, whose targets should be reached by 2010.

The targets set by *SwissEnergy* as part of the Swiss contribution to the Bonn plan of action, are:

- An increase of the share of electricity production from "new" renewable energy sources of 1 percentage point by 2010, i.e. from 1.3 to 2.3 percent (or 500 GWh).
- An increase in the share of heat generation from "new" renewable energy sources of 3 percentage points (or 3000 GWh) by 2010.

In the 1990s, around CHF 287 million (€ 185 million) was allocated to the furtherance of the new renewable energy sources. The federal government subsidised the use of fuel wood with an additional CHF 45 million (€ 29 million) after the storm "Lothar" had devastated large areas of forest in late 1999.



Coupon

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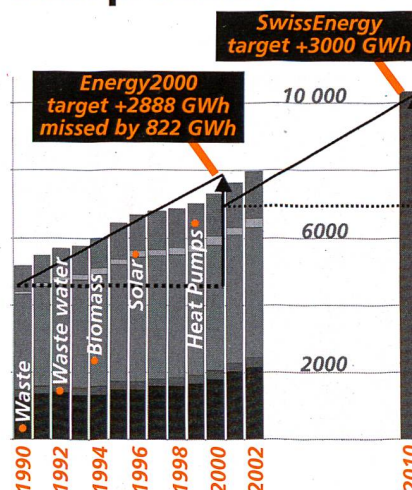
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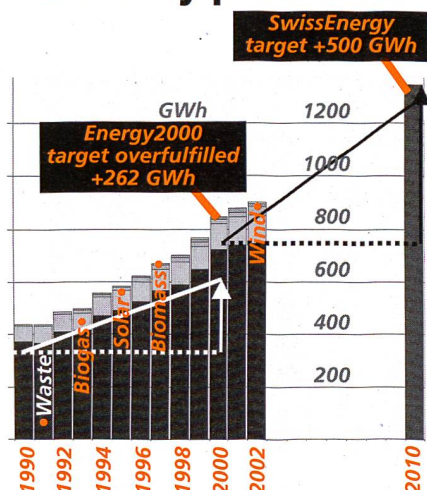
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Heat production



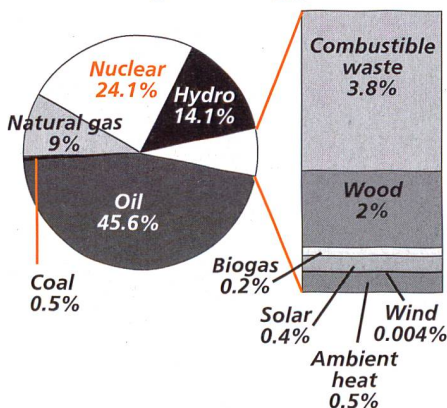
Electricity production



Waste combustion and biomass contribute the largest share of electricity production from new renewables.

The *SwissEnergy* programme allows for the yearly federal allocation of CHF 28 million (€ 18 million) to renewables (plus additional co-financing from cantons and local authorities). *SwissEnergy* wants to motivate the cantons to greater harmonisation of their regulation. As regards heat generation the programme has stayed on course up till now, but the efforts in electricity production have to be doubled.

Primary energy



Including hydropower, the renewables contributed 21% of Swiss energy supply in 2002.

Guiding principles. New renewable energy sources can mostly only penetrate the market with massive state aid. In Switzerland, politics has a significant say in the utilisation of renewable energy sources.

With the direct democracy system, Swiss voters can continually influence legislation by means of popular votes – not always to the benefit of renewable energies. In 2000, three proposals for taxing non-renewable energy sources were rejected. In 2002, an electricity market law (with articles for the promotion of renewable energy) was turned down, as were proposals to phase out nuclear energy in 2003.

Another guiding principle of Swiss energy policy comes from federalism and the *subsidiarity principle* that goes with it: the Federal state steers with framework directives and delegates the implementation to the cantons.

This is the case for instance with *feed-in tariffs*. At the beginning of the 1990s, Switzerland was one of the first European countries to introduce feed-in tariffs.

Voluntary agreements. Furthermore, voluntary agreements with economic players are another favoured energy policy tool. They were

first introduced in 1990. One lesson from the programme of the 1990s was that voluntary measures are not stringent enough to reach ambitious targets. That is why the 2000 CO₂ Law, which stipulates a 10% reduction in CO₂ emissions by 2010 in accordance with the Swiss Kyoto target, calls for introducing a CO₂ levy from 2004 at the earliest if it can be seen that the target will not be attained through voluntary measures. Companies that sufficiently reduce their CO₂ emissions will not be subject to the levy.

Research. The Swiss are well advanced in the area of research, development and demonstration (RD&D). Between 1990 and 2001, Switzerland was one of the six industrialised nations that contributed 82 percent of RD&D in the renewables sector. In 2001, some 30 percent of Swiss energy research funds were allocated to renewable energy projects.

The examples on the following pages bear witness to Swiss creativity in the area of renewable energy sources.

INTERVIEW

"We have been overtaken"

Five questions to National Councillor Doris Stump, member of the Swiss delegation to the Bonn Conference.

What does the Swiss delegation expect from its participation at the Bonn conference on renewable energy?

We are interested in developments in other countries. We can learn from positive examples and experiences, communicate our success stories and make our products known.

In which areas can you highlight Switzerland as a pioneering country, or a country which can advise and/or support other countries?

The promotion of the Kompogas project has been extremely successful. Biogas is also being used to power vehicles. Kompogas plants are under construction in other countries. Furthermore, the Swiss quality assurance concept for heat pumps and large wood-heating systems, for example, is a subject of great interest in various countries and in some cases has been taken over entirely. Switzerland has also performed pioneering work in the area of integrating photovoltaic installations. This includes aesthetic integration in pitched roofs, the use of translucent modules in roofs and the use of solar cells in noise abatement walls. The overall concept is that of the multi-functionality of solar systems.

In what areas can Switzerland benefit from international cooperation?

International cooperation is of major significance for all areas of energy efficiency and renewables. Cooperation has a long history in research. In terms of P&D and bringing to market, cooperation must be fundamentally strengthened, especially in view of the fact that these final development stages are cost-intensive and the small Swiss market alone cannot repay the development costs.

We are also able to present our modern technologies to an interested international audience. At the same time we can study the for-

eign support programmes for renewables and learn from their experience.

What role does the AEE (Swiss Agency for Renewable Energy and Energy Efficiency) play in the international dialogue on renewables?

So far the individual member associations of the AEE have fostered contacts with European countries. The AEE itself has concentrated on activities in Switzerland. I shall be availing myself of the opportunity to make contact with representatives of other energy agencies in order to network ourselves internationally.

How has Switzerland's position on renewable energy changed over the last few years compared with other countries?

The high proportion of hydropower in the Swiss electricity supply system gave us a leading position with regard to renewable energy. For a long time our country was therefore a model as far as promoting new sources of renewable energy within the framework of *Energy2000*. In the meantime, other nations have overtaken us. The EU programme to double the share of renewable energy by 2010 is worthy of particular mention in this context. In various member states of the Union, large-scale wind power installations, solar power plants and biogas plants are being built and tens of thousands of new jobs have already been created. There is consequently a pressing need for an effective support programme in Switzerland.



Dr Doris Stump, 54, now a publisher, originally a high-school teacher of German and English, is the vice-president of the Swiss Agency for Renewable Energy and Energy Efficiency. Since 1990 she has been a municipal councillor in Wetztingen, and since 1995 she has sat as a social democrat in the National Council, the lower house of the Swiss parliament.