

# SWISS ENERGY POLICY: ACHIEVEMENTS, OUTLOOK AND ROLE OF HEAT PUMPING TECHNOLOGIES

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**Abstract:** The Swiss energy policy became a new impulse on January 2007. The government decided to focus on 4 pillars:

- Higher efficiency
- Increase use of renewable energies
- Build new power plants if necessary
- More foreign policy, especially with the EU

2008 is an important year: the tax on CO<sub>2</sub> was introduced on combustibles and the new federal electricity supply act entered in force on the 1st of January. The electricity market will be progressively opened to consumers, step by step. It introduces also the cost-covering remuneration for the input into the network of electricity produced from renewable energy sources. An annual sum of around 320 million Swiss francs has been budgeted for this purpose.

The goals for 2020 are set: share of renewable energies should be increased of 50%, the consumption of fossil energies should be reduced of 20% and the electricity consumption should not increase more than 5%.

Heat pumps in the heating sector will play a key role among the renewables. The development of the past 15 years under the umbrella of the program SwissEnergy of the federal office of energy will be continued. The potential of heat pumps is a reduction of the fossil energy consumption – and also CO<sub>2</sub> - of 10% by 2020.

**Key Words:** *energy, policy, tax, CO<sub>2</sub>, renewable, heat pump, heating*

## 1 SWISS ENERGY STRATEGY

In January 2007 the Swiss Federal Office of Energy's work on energy perspectives up until 2035 were concluded and presented. The results form the basis for political debate on the future direction of Switzerland's energy and climate policies.

The energy perspectives point to an increase in demand for electricity in Switzerland by 2035 of around 20% and a deficit of roughly 17 billion kWh if no extra measures are taken. This corresponds to twice the annual production of a Swiss nuclear power station. This development and the unharnessed potential in the areas of efficiency and renewable energies prompted Switzerland's Federal Council to decide on a reorientation of its energy policy in 2007. This is based on four pillars:

1. Improved energy efficiency
2. Promotion of renewable energy
3. Targeted extension and construction of large-scale power stations
4. Intensification of foreign energy policy, particularly in terms of cooperation with the EU.

## **2 CO<sub>2</sub> TAX ON FUELS AND REVISED ENERGY ACT**

In January 2008, the CO<sub>2</sub> tax on fuels has been introduced and the first package of the new Energy Supply Act (StromVG) has entered into force. The new Electricity Supply Act creates the necessary conditions for a progressive opening of Switzerland's electricity market. From 2009 some 50,000 large customers with an annual electricity consumption of over 100 megawatt hours will be able to benefit from this partial opening and be free to choose their power suppliers. But all other power consumers will benefit right from the start too because their electricity suppliers will also be able to buy in their electricity from the free market and pass on any price savings to their customers. Furthermore, the Electricity Supply Act delivers a clear legal framework for cross-border trade in electricity. In actual fact the opening of the electricity market is already well advanced around Switzerland. Liberalisation also results in cost transparency: As the opening of the electricity market also involves the unbundling of the network and energy provision, the cost of network usage and actual electricity consumption will in future have to appear separately on bills. That way customers will know just how much they are paying for the network, how much in charges and how much the electricity itself costs.

The revised Energy Act was also adopted, along with the Electricity Supply Act. It stipulates that energy production from renewable energies must be increased to at least 5400 gigawatt hours by 2030. The Act envisages targeted measures to promote renewable energies and greater efficiency. The most important instrument is the cost-covering feed-in price for power from renewable energy sources from solar power, biomass, small-scale hydropower and wind. It will ensure a major boost in power from renewable energies from 2009.

## **3 PROMOTION OF RENEWABLE ENERGY**

The Federal Council set in February 2008 important markers to promote the use of renewable energies and improve energy efficiency. The goals are clear: By 2020 the share of renewable energies in overall energy consumption should be raised by at least 50% from 16.2% today to 24%. The consumption of fossil fuels should be reduced by 20% between 2010 and 2020 and electricity consumption should increase by a maximum of 5% over the same period. The measures that lead to these goals are primarily strengthened instruments such as regulations, standards and bans in the area of appliances, buildings and vehicles. These measures go hand in hand with a strong push in the area of research and in training.

Politicians have to set the conditions for an energy policy which pursues the goals of security of supply, competition and sustainability. However, the State cannot achieve the turnaround in the energy sector alone. It also needs motivated experts such as you, researchers with innovative ideas and concepts, entrepreneurial firms and investors and ultimately well-informed citizens who support sustainability.

## **4 ACHIEVEMENTS AND OUTLOOK FOR HEAT PUMPS**

To reach the goals, it needs environmentally-friendly techniques and applications for energy production. Heat pumps will play a very important role. Over the past 15 years they have established themselves as a safe and clean heating system and are now a firm feature of the market. The Swiss Federal Office of Energy has played a significant role, particularly in the financing of measures to raise and assure quality and training.

In contrast to many neighbouring countries, heat pumps are classified in Switzerland as systems that harness renewable energy. This reflects the physical realities: each heat pump

used for heating purposes makes use of renewable energies. But the overall energy balance is positive only if minimal requirements for efficiency are set and reached. That is why a test centre was opened as early as 1993 and the quality seal was introduced for appliances and then for drilling companies in 1998. Parallel to that, a campaign of field measurements was started in 1995.

The efforts of the federal government and of business together as part of the SwissEnergy programme are a success. In 2007, for the first time since statistics on heating were recorded, there were more installations of heat pumps than oil furnaces in Switzerland! The heating market split is no longer 80% oil furnaces and 20% gas furnaces, but in thirds: 17'000 new heat pumps, 15'000 new gas furnaces and 14'000 new oil furnaces.

So at the end of 2007 there were 126'000 heat pumps in operation in Switzerland. However, there is still huge potential: there are another 1 million furnaces and 170'000 electric resistance heating units to replace. That would release enough electricity for a further 500'000 heat pumps.

Realistically, and without increasing electricity consumption, an additional 230'000 heat pumps should be installed by the end of 2020, which would lower fossil fuel consumption by 10%.

The necessary power can be obtained by replacing electric direct heating systems so as not to overshoot electricity consumption targets, or from combined heat and power plants, which replace or supplement oil or gas furnaces in order to meet the CO<sub>2</sub> reduction target.

The heat pump will play an important role in Switzerland and around the world in reducing CO<sub>2</sub> emissions. As a small and federally-structured country, we have long known that we are stronger together. That's why we have been committed to and actively involved in the IEA's Heat Pump Programme since 1984.

The heat pump history began here about one century ago: in 1879, Sulzer installed the first refrigeration plant in Switzerland for the Hürlimann brewery in Zurich. So the organisation and hosting of the 9th IEA Heat Pump Conference here in Zurich is a pleasure, an honour and a sign of our commitment to the IEA, to the heat pump programme and to the future of energy based on efficiency and renewable energies.

Welcome to the land of heat pumps! I hope you enjoy the conference.

## 5 REFERENCES

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