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Switzerland plans its energy policy for a post-nuclear future

Fukushima has caused a fundamental shift in Switzerland's energy policy. The Federal Council decided to withdraw from nuclear energy in the wake of the disaster and is now pressing for a complete change of direction. But what does the expression "energy turnaround" so often heard today actually mean? Who wants to turn and to where?
By Marc Lettau

14 March 2011: Federal Councillor Doris Leuthard outlines the government's energy turnaround plans to the media in the parliament building

After the seemingly never-ending cold and wet winter weather, the sunshine finally appeared in Switzerland at the end of May. But the good weather had hardly settled before storm clouds gathered over the federal capital, Berne. There was a ferocious debate over the service life of Switzerland's nuclear power stations in the National Council in June. Should the nuclear power plants, all of which are somewhat outmoded, be allowed to operate indefinitely provided constant investment is made in their safety? Or should they have an officially decreed decommissioning date when they will be shut down definitively?

The National Council's Energy Committee proposes a maximum duration of 50 years. The Greens consider that to be excessive. They want the nuclear power stations to be closed down within no more than 45 years. They also called for this in a popular initiative submitted in 2012. The predominantly conservative National Council members, taking account of the concerns of the nuclear power plant operators, are instead pushing to avoid the stipulation of a decommissioning date as safety might be neglected in the final years of operation. The plants would become more hazardous rather than safer.

The row has not yet been settled as the National Council has deferred its decision until later in the year. The debate is nevertheless remarkable. Instead of haggling over when and where new nuclear power stations would be built, as was still the case several years ago, only nuclear decommissioning is now on the agenda. The nuclear power plants in operation today are therefore obsolescent models. What has happened?

The shock announcement was made on 14 March 2011. On that Monday, the Energy Minister, Doris Leuthard (CVP), turned Swiss energy policy upside down with a short statement. The Federal Councillor announced that Switzerland would undertake a "well-structured" withdrawal from nuclear power because "the safety and wellbeing of the Swiss people was paramount". The stark impact of the statement was that applications already submitted for permission to construct two new nuclear power plants in Switzerland were unceremoniously put on ice. With their propensity for brevity, the media pointed out that an "energy turnaround" was on the way.

The earth shook, confidence was shattered

There is little doubt as to what led the Energy Minister to embark upon a new course that Monday morning. It was the terrible events that occurred three days before Leuthard's announcement and which had etched themselves into the consciousness of the global community. In short, an earthquake occurred at 2.46 p.m. on 11 March 2011 in the Pacific Ocean off the coast of the Japanese region of Tohoku. The rise and fall of the tectonic plates triggered a powerful tsunami that hit the Japanese mainland just under an hour later killing at least 16,000 people. The barely describable human tragedy was accompanied by one of the greatest technological catastrophes of the modern age – the violent earthquake and the subsequent tsunami hit the six nuclear reactors of Fukushima Daiichi. The operator Tepco was unable to shut down the reactors in a controlled manner amid the chaos of devastation. The post-cooling system in the plants that had been shut down failed to function. There were explosions in four reactors and a core meltdown in three. Large amounts of radioactive substances entered the atmosphere and the sea. Japan's main island moved two metres to the east as a result of the tremors. The Earth's mass distribution changed so much that since then the Earth has been turning slightly more quickly. In Berne, too.

Energy policy with climatic objectives

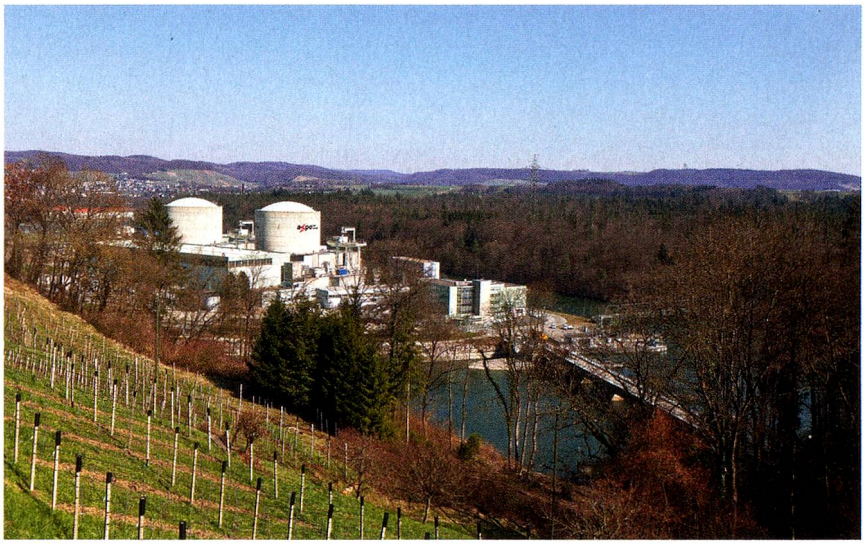
Since the shock of Fukushima, the federal authorities have picked up the pace of work on the fundamental reorganisation of Swiss energy policy. The tool being deployed is entitled "Energy Strategy 2050". This aims to reduce energy and power consumption per person, which is still rising steadily. It outlines how environmentally damaging emissions are to be cut significantly by 2050. This makes it clear that the strategy goes far beyond withdrawal from nuclear energy and the reorganisation of power supply – it seeks to bring the abandonment of nuclear power and climate protection under one umbrella. However, Switzerland must reduce its dependence on crude oil to achieve this. Fossil fuels still meet around three quarters of the nation's energy requirements. The remaining quarter is pri-

Photo: Keystone

marily covered by electricity, around 40% of which is nuclear power. In order to achieve the objective set out, federal government experts recommend making much more efficient usage of power on the one hand and generating significantly more electricity from solar and wind plants on the other. Faster and simpler authorisation procedures are proposed, and an upgrading and expansion of the power grids is being called for. A further recommendation is the use of gas-fired power plants to secure power supply over the medium term. Parliament is likely to discuss and evaluate this extensive set of measures, which will require the amendment of various laws, before the end of this year.

"Planned-economy attitudes"

Judgements are already being formed. Environmental campaigners protest that as long as no date is set for the decommissioning of the existing five nuclear power stations (Beznau I, Beznau II, Gösgen, Mühleberg, Leibstadt) no impetus can be generated for a genuine energy turnaround. In contrast, many business representatives claim that the Federal Council is pursuing an "unrealistic" energy policy. Industry is nevertheless excited about the employment opportunities that could be created through the expansion of renewable energies. The most optimistic estimates indicate up to 100,000 additional jobs. The mood in export-oriented sectors, however, is much more downbeat. They fear that increasing energy costs at home might damage their competitiveness abroad. The industry association Swissmem, which represents the interests of the mechanical, electrical and metal industries, has levelled criticism at the Federal Council for overestimating the opportunities for improving energy efficiency and more intensive deployment of alternative, renewable sources of energy. Jean-Philippe Kohl, head of the economic policy unit at Swissmem, even points to "planned-economy attitudes" and "overoptimistic faith in feasibility". He says the fact that many things must happen concurrently for fundamental restructuring of the energy system to occur has been overlooked in the government's haste – the investment in new technologies, the extension of the grids, better integration into the European power market and the construction of new storage facilities because the power produced at solar and wind power plants fluctuates greatly in contrast to that from nuclear power. Kohl believes the Federal Council's "Energy Strategy 2050" will be absolutely fundamental. He remarks: "For electricity, in particular, this means a rejection of central power production in favour of a decentralised system involving a high degree of state intervention." He also underlines that the export-oriented sectors are not opposed to a more sustainable energy supply but are urging a reorganisation of energy and climate policy that is in step with the international community. The idea that Switzerland must "set a good example" is "extremely naïve". Swissmem and other business federations are sceptical about the increase in subsidies to promote alternative, sustainable sources of energy: "We fear that Switzerland will become shackled to a policy of subsidisation."



Beznau nuclear power plant, the oldest reactor in the world, is still in operation

"Effectively a sham withdrawal"

Jürg Buri, the managing director of the Swiss Energy Foundation (SES), represents a completely different position. The foundation, which has been campaigning for an "intelligent, ecological and equitable energy policy" since 1976 and supports the model of the 2000-watt society (see text below), is following current developments with some satisfaction, according to Buri. More efficient energy usage, the abandonment of nuclear power, reduction of dependence on limited fossil fuels and the much more intensive deployment of alternative, sustainable sources of energy – these objectives from the "Energy Strategy 2050" sound as though they might have been copied directly from an SES paper. Though Buri does have reservations. The general direction being pursued with the energy turnaround is indeed the right way forward and the Energy Minister has made an extremely important contribution, he says. "She understands the issue. She correctly made the withdrawal from nuclear power into an energy turnaround." Buri welcomes the fact that Leuthard is fostering a debate on overall energy consumption. However, he believes that the abandonment of nuclear power is unfortunately half-hearted: "The publicised structured withdrawal is effectively a sham withdrawal. No new nuclear power stations are being built but the current operators instead want to continue running their existing plants for much longer." Like many other environmental organisations, the SES is therefore pressing for clear decommissioning dates for the outmoded nuclear power plants. Constantly upgrading outdated facilities will result in the absurd situation of Switzerland refraining from constructing new nuclear power stations on safety grounds but incurring increasingly greater safety risks by continuing to operate "dilapidated" plants than it would by building new ones.

Divided camp

However, heated disputes are also taking place within this political and ideological camp. Many environmental campaigners are seeking to drive forward but at the same time hold back the energy turnaround. They generally support the turnaround but are opposed to new pressures being placed on nature, water, the countryside, urban landscapes and the climate. For example, they clearly consider electricity from hydropower to have a natural aura. However, sacrificing the last nearly natural rivers to produce po-

Photo: Keystone

A glimpse into the future: rooftop solar panels in Schiers (Grisons), countryside dotted with wind turbines in southern Germany, and the façades of older buildings newly clad with solar panelling, as at the Sihlweid building project in Zurich

wer contradicts their principles of protection. The most radical among them are consequently calling for the energy turnaround to focus solely on reductions in consumption.

Business associations are also in disagreement. Swissmem and Economiesuisse, Switzerland's largest business federation, take a highly critical view of the "Energy Strategy 2050". However, Swisscleantech, a green business association, has stirred up the debate by strongly advocating resource-efficient and low-emission economic activity with no strings attached.

An inconspicuous energy lobby

The major energy companies, such as Alpiq, Axpo and BKW, are adopting a relatively low-key approach. They are having difficulty in extricating themselves from the paralysis caused by the Fukushima tragedy. Heinz Karrer, CEO of Axpo Holding, who until Fukushima was a much quoted, vociferous advocate of new nuclear power stations, has remained conspicuously inconspicuous. He restricts himself to warning against setting the course of the agenda too hastily. The energy turnaround is not a sprint: "We would tire long before the finishing line comes into sight," he observes. The reticence of the major energy companies is explained by the fact that they are the potential losers in the turnaround. If hundreds of thousands of people were to one day actually install solar panels on the roofs of their houses and feed decentrally generated power into the grid, they would find themselves in a quandary. It would no longer be the major companies that would be the market-defining players, but all the small electricity plants which still had direct customer contact. In contrast, the large companies would find themselves sitting on their gigantic infrastructures.

Struggle for power and monopoly

Political observers, such as the Zurich-based economist and publicist Christoph Zollinger, rub salt into this wound. He can see no major technical obstacles in the way of the energy turnaround. He regards the real hurdles as the psychological block and the power struggle behind the scenes. If an entire nation were to set about producing its own energy – such as with solar rooftop systems – the role and influence of the existing energy suppliers would change dramatically. Zollinger remarks: "The row over the future of energy is also a battle for emoluments, vested rights, power and monopoly. The energy turnaround constitutes a monumental reorganisation of our society."

A bottom-up turnaround

Anyone just following the political debate at national level might come to the conclusion that the energy turnaround in Switzerland is actually "a huge chest", as Federal Councillor Leuthard put it, but one that, for the moment, is full of nothing but planned measures. This impression is deceiving as cities and larger urban communes, in particular, are already working towards a new future. They are implementing the turnaround. The commune of Payerne (canton of Vaud) is currently planning to construct Switzerland's largest solar facility. 100,000 square metres of solar panelling is being installed on the rooftops. The solar-generated power is expected to meet the demand of all of the town's 9,500 inhabitants. Payerne is no exceptional case either, as many communes are currently calculating how much sun shines on their rooftops. Köniz, a suburb of Berne, concluded after evaluating all its rooftops that the amount of usable solar energy shining on its roofs corresponds exactly to the power consumption of its 40,000 residents. Rita Haudenschild, director of environmental affairs in Köniz, believes that federal government's estimates of the potential of solar power set out in its energy strategy are "far too conservative" as well over 20% of power can be generated from solar sources.

Elsewhere, it is not politicians but rather smaller power plants that are setting the pace. They are upgrading their local power networks so that more private producers can feed electricity into the grid without any technical problems. This is the key technical requirement for promoting the decentralised, sustainable generation of energy. It is also the smaller power plants that are seeking to address consumer concerns over unaffordable electricity bills. Peter Lehmann, an energy expert and CEO of the regional energy supplier for Wohlen in the "nuclear canton" of Aargau, argues that the Swiss people can afford even a dramatic turnaround – a power supply system consisting exclusively of renewable sources. He remarks: "Assuming that each individual will consume 25% less power by 2050 than at present thanks to more efficient technology, the additional costs for an average four-person household would amount to around 400 Swiss francs a year. This shows that the additional costs are manageable and can most certainly be financed."

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SWISS SOLUTIONS TO AN IRREPRESSIBLE DEMAND FOR ENERGY

Swiss people's perspective on the issue of energy is changing. When the OPEC countries restricted oil production during the 1973 oil crisis, the main concern was price. Strict speed limits and Sunday driving bans were enforced in Switzerland. This did nothing to change energy costs that had climbed by 70%. In contrast, many environmental organisations today complain that energy prices are so low that wastage can scarcely be stemmed. The constantly rising demand for energy is also speeding up climate change. The main issue is increasingly the quantity consumed.

Since the 1990s, the Federal Institute of Technology in Zurich has been carrying out think-tank work on how human energy consumption can be reduced to sustainable levels. It has developed the model of a 2000-watt society. The basic concept is that the energy requirements of each individual cannot exceed an average output of 2000 watts if global energy consumption and the emission of environmentally damaging greenhouse gases are to be reduced to an acceptable level. On an annual basis, this means that 17,500 kilowatt hours (kWh) should meet every individual's requirements for heating, mobility and food. In order to achieve this objective, Switzerland would have to turn the clock back by 50 years in terms of energy consumption to return to the levels of 1960.

The researchers at the Federal Institute of Technology are not calling for austerity. They are endeavouring to find technological solutions to maintain current living standards but with much lower energy consumption. The 2000-watt-society model is already having an impact in Switzerland's housing sector. New buildings are today generally well-insulated and have very low energy requirements for heating, cooling and air-conditioning. The market shares of highly energy-efficient devices and low-consumption cars are also increasing. However, because new – energy-consuming – needs are constantly being created, overall energy consumption per capita is still rising.

The Swiss are therefore still a long way off achieving a sustainable lifestyle. Primary energy requirements currently stand at 6,300 watts per person, while annual CO_2 emissions amount to around nine tonnes per person. The sustainability target is a maximum of one tonne of CO_2 per person. The "Energy Strategy 2050" presented by the Federal Council should nevertheless significantly reduce CO_2 emissions and cut energy consumption to around 4,000 watts.

Does the sustainable 2000-watt society remain a utopic dream despite the energy turnaround? The Swiss Federal Laboratories for Materials Science and Technology (Empa) in Dübendorf presented sobering study results in May. Only around 2% of Swiss people are currently meeting the objectives of the 2000-watt society. What the Empa researchers discovered was that while lower energy consumption is achievable, few people reach the low CO_2 emissions targeted. The problem is not just high energy consumption but the fact that a very large share of energy requirements is still being met with crude oil. Head of Research Dominic A. Notter reveals: "The eating behaviour alone of those surveyed produces almost a tonne of CO_2 per person annually." Notter does not support the notion that everything can be put back on track without living standards being affected: "We must adopt a more frugal approach."

Individual footprints

But what does a frugal approach mean? Few people are able to quantify their "energy requirements". However, that is also changing given the increasing number of devices for calculating a person's own environmental footprint (example: www.ecospeed.ch). This acid test will, of course, show that most people have a long way to go before they can have a clear conscience. (mul)

http://www.energiestiftung.ch; http://www.swisscleantech.ch; http://www.ecospeed.ch; http://www.2000watt.ch; http://www.energybox.ch

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