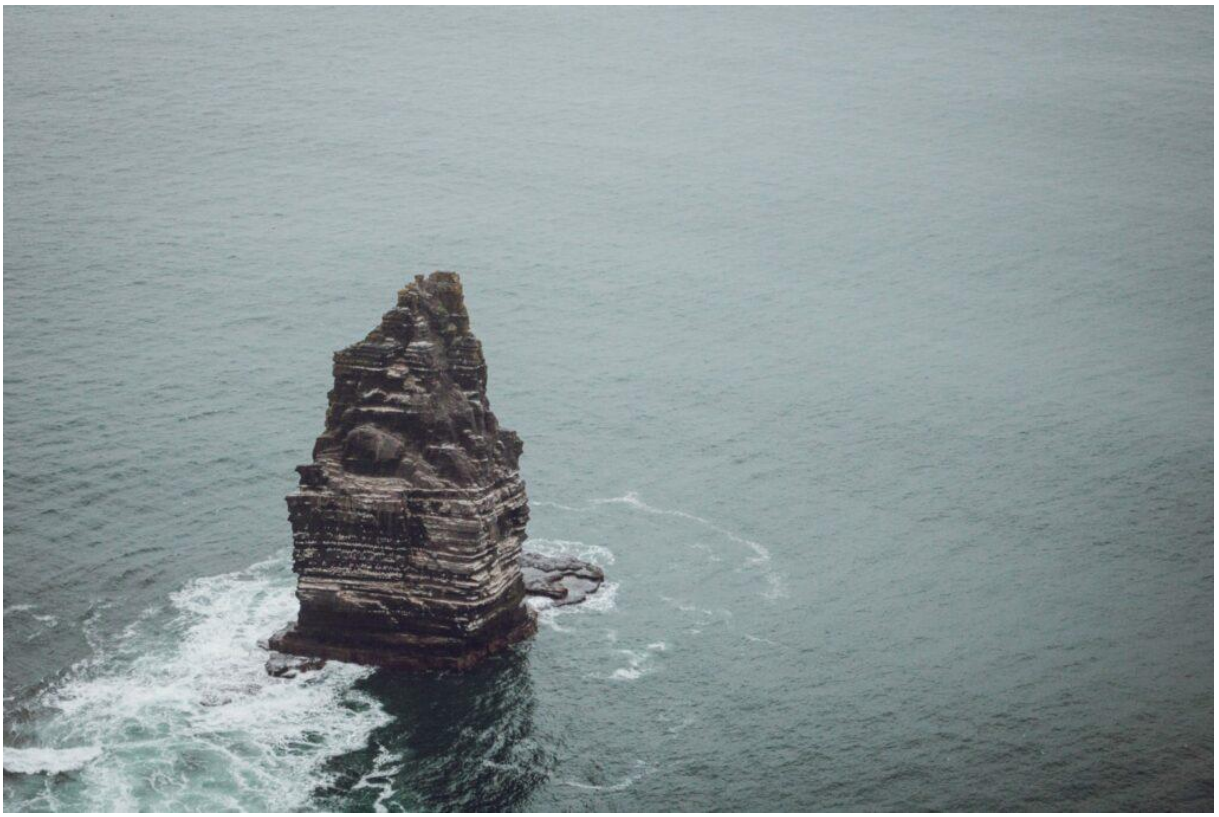
How good is the climate policy?



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In addition to dealing with the Corona pandemic, science is warning of a second, greater challenge: A global climate catastrophe is looming. Individuals can contribute a great deal to the energy turnaround, but the reins are in the hands of politics. At the moment, Swiss politicians are rather overwhelmed by the task and are groping in the dark when it comes to the future storage of energy. A review - Silvio Bonzanigo.

When Dominik Siegrist (64) looks down the 100 meters from the Trift suspension bridge in the Susten region to the valley floor, he is overwhelmed by a double sense of melancholy. Siegrist, who teaches «Landscape and Open Space» at the University of Applied Sciences in Rapperswil, longs for the Trift glacier, which has been wiped out by global warming; just a few years ago, the ascent to the Trift hut led over the glacier instead of over the suspension bridge. Above all, however, he is dizzy about the planned 167-meter-high dam that the Oberhasli KWO power plant wants to build here for a reservoir.

It is currently the only project for a new storage power plant in Switzerland. It recently overcame another obstacle: The Bernese government approved the KWO's concession application. But the project still has a long way to go in this «primeval landscape,» as Siegrist calls it. He and the «Trift Committee» continue to fight against its flooding.

Energy and politics come together

The conflict between KWO and the Trift Committee is the clash of energy policy and landscape protection in the 21st century. For many centuries, however, energy and politics had nothing in common. Energy production was a private matter. Wood and coal heating systems (hypocaustum) were operated in ancient Greece without the supervision of the polis (urban citizens). Today's politics sprouted from the concept of politica. This is to regulate social needs through binding values and norms.

In Switzerland, politics first became active in the energy sector when the Lucerne High Council concluded a contract in May 1886 with the Troller brothers from Littau for the supply of alternating current. The electricity was used for the first street lighting in a Swiss city. As a world premiere, an energy producer here supplied its electricity to a third party via a grid in return for payment.

From this point on, it was unthinkable to generate and sell energy without the involvement of the public sector. Anyone who wanted to generate electricity from water using turbines had to acquire water rights. Anyone who later wanted to convert coal into electricity or sell natural gas needed a concession. Anyone who wanted to supply the emerging mobility with gasoline and diesel had to pay taxes to the state. In all democratic societies, as in Switzerland, politics took over the control of the national energy supply.

The state and the energy industry formed a harmonious team: the state protected producers from competition and in return collected taxes and other levies on all energy sources. However, energy policy was not enshrined in the Swiss constitution until 1990. Article 89 of the Federal Constitution regulates the relationship between the Confederation and the cantons and ensures an adequate, diversified, secure, economical and environmentally compatible energy supply as well as economical and rational energy consumption.

Energy policy mutates into climate policy

For decades, this mutual service ran smoothly. But on the evening of 5th December 1952, the idyll shattered. The scene was London. A blanket of smog descended on the city, unlike anything mankind had ever seen. For the next three days, visibility was just one foot (30.48 cm), the legendary bus service was suspended and ambulances no longer ran. Cinema performances were canceled because the audience could no longer see the screen. The alarm value for sulphur dioxide in force today exceeded sevenfold. Adverse weather conditions contributed to what was happening, but the real cause was the exhaust fumes from coal-fired indoor stoves.
It was at this moment that climate policy was born, which four years later resulted in the UK government's Clean Air Act. This prohibited the burning of coal in private households under certain circumstances and within certain geographical limits.
In the USA, a similar Pollution Control Act was passed on 14th July 1955. For the first time, finances were allocated to research into air pollution control. In 1963, both US chambers passed the Clean Air Act. It was the world's first climate policy legislation with far-reaching effects. The rationale for air pollution control was the same then as it is now: human and animal life and the environment must be protected from toxins. Yet, in 2018, the medical community still estimates that one in five deaths worldwide can be attributed to air pollution.

Swiss climate policy: plenty of micromanagement, but no master plan

This is everyday climate politics in Bern: The National Council and the Council of States have been haggling for days about CO_2 pricing for private flights. Since a flat rate of 500 Swiss francs did not find a majority, graduated contributions of between 500 and 5000 Swiss francs are now to apply, depending on travel distance and departure weight, which again did not find a majority.

Finally, the unification conference of the two councils reached a compromise of 50 to 3,000 francs. Parliamentarians also like to deal with the cost sharing between tenants and landlords when installing charging stations for electric cars in apartment buildings. These examples represent climate policy micromanagement.
What is missing in Swiss politics so far, however, is an actual master plan on how the climate strategy is to be implemented. For example, there is no idea of how and where the often-cited high-quality jobs in the renewable energy sector are to be created. Due to the Chinese price offensive in the solar market, the number of employees in the Swiss solar industry even collapsed to less than half from 2012.
The current policy also lacks the power of persuasion for the industry, which smells a disadvantage compared to foreign competitors behind every fiscal burden. Without reliable evidence, however, the Federal Council's climate strategy assures «that the reduction to net zero will pay off in the longer term and significantly exceed the necessary investments».
There is a glimmer of hope that the energy transition will somehow succeed and that it will not cost too much. Having to deal with a second huge cost driver besides Corona is causing political concern. According to the currently most widely accepted cost model of the Paul Scherrer Institute, the Swiss climate change will cost a net 92 billion Swiss francs (150 billion in investments, 67 billion in saved energy costs). In comparison, the fight against the Corona pandemic threatens to become more expensive. The measures taken by the federal government and the cantons, including the losses incurred by private industry, will add up to 138 billion Swiss francs by the end of 2020 alone.

Simple calculations gone wrong

Switzerland has the best prerequisites for a climate-friendly supply of renewable electricity. Hydropower plants account for around 57% of electricity production. Solar and wind power will replace nuclear power (35 %) and conventional thermal plants (4 %) in the future. The rest (4%) is already covered by renewable energies. The rest is zero – so it's all fun and games! Wrong. In the future, considerably more green electricity will be needed in Switzerland for heat pump heating, for e-mobility and for the digitalisation of the working world.
Despite efforts to reduce consumption, the energy demand will increase by 24 percent by 2050 according to the ZERO Basis scenario of the Federal Office. The main drivers are the growing population, more areas to be heated and additional goods and passenger transport.
In these apparently simple additions, the miscalculations add up. Especially in winter, the fluttering energies of sun and

wind can in no way replace the ribbon power of the nuclear power plants.
Like the «Vernunftkraft» protection association in Germany, the Foundation for Landscape Protection and Helvetia Nostra are almost completely paralysing the development of wind power. Legal proceedings with an uncertain outcome, which can take 15 years for a wind farm, deter initiators and investors.
Switzerland is already lagging far behind in green electricity from wind power. Instead of generating 600 gigawatt hours of wind power by 2020 as planned, it was enough for barely 150 gigawatt hours. Wind power can no longer be expected to make a significant contribution to climate change. This is disastrous because it could have mitigated the night-time shortfalls in photovoltaics.
Some politicians therefore want to generate more electricity from hydropower. The storage potential of existing dams can be increased by raising the walls. If the 17 most suitable Swiss reservoirs are expanded, electricity production in the winter half-year increases from 48 to a maximum of 62 percent of annual production.
New reservoir projects such as the Trift basin on the Susten Pass have an even more difficult political time than raising the dam. What the politicians overlook: Pumped storage power plants do not supply the required band energy in the winter half-year, but cover demand peaks and provide voltage balancing in the grid. What should be done when wind power is no longer available? What if geothermal energy has not yet produced a kilowatt-hour of electricity? What if biomass used to generate electricity remains a niche product because we don't want large-scale forest clearance in Switzerland? What if combined heat and power plants exist mainly on planning paper?

Photovoltaics is only partially effective

That is why politicians are forced to rely on photovoltaics. Roger Nordmann, author and SP National Councillor, wants to increase its output 25-fold by 2050. This could work out well if an oversized expansion of photovoltaics would solve the resource problem. However, only a small part of the maximum 36 terawatt hours of surplus electricity that could be produced in Switzerland in the summer of 2050 can be saved for the winter. There is a lack of seasonal energy storage. It is therefore of little help to cover the roofs and façades of private

and public buildings and industrial buildings as well as all barns with solar panels.
Moreover, agriculture has lost its appetite for investment. In the years 2011-2015, Swiss agriculture invested significantly more in solar systems than is currently the case. The reason for this is the collapse in feed-in tariff prices. New models are needed here, as both open-ended forms and one-off payments have not proved successful.

Switzerland: a reservoir of money, but not of energy

Malicious tongues call Switzerland the piggy bank of the world. At least our country has experience in managing finances. Until now, this has also been true for essential goods and services. The Federal Law on National Economic Supply also includes the energy sector. The law assigns national supply to the economy. The Confederation is only to intervene if necessary in the event of severe energy shortages. Currently, 12 million tonnes of crude oil and petroleum are stored in almost one hundred large tank farms in Switzerland to guarantee the energy supply for a limited period of time.
In view of the non-fossil and non-nuclear energies favored by the Energy Strategy 2050, this finding is frightening: Switzerland wants to manage without energy reserves in the future! Politicians are completely in the dark as to how emergency energy storage is to be designed in the future.

Methanol storage in disused oil tank farms?

What is needed is a storage facility that can release excess summer electricity in winter for various applications. So far, Swiss politicians have turned a blind eye and a deaf ear to this task.
An ideal storage medium is methanol, which is completely easy to handle. The necessary quantities of methanol cannot be produced in Switzerland alone. It should be produced where wind and sun promise plenty of green electricity. This is needed to produce methanol from CO_2 and hydrogen. Just like natural gas and petroleum products, green methanol can be transported in tankers or via existing pipelines and

bunkered in existing Swiss tank facilities. If required, these reserves can be converted into electricity and heat in combined heat and power plants.
In the same way, the company Porsche is seeking its fortune in Patagonia. On the windy Strait of Magellan, it has turbines rotating, the electricity from which can be used to produce green methanol and, in turn, synthetic fuels (synfuels). Porsche wants to use this to power its lighthouse projects in racing. The project in Haru Oni, Chile, was deemed worth a support of 20 million euros from the German government.

Export know-how – import energy

Switzerland is regarded worldwide as a guarantor of technical innovations. Not only the bicycle chain, the zip fastener, the watch tourbillon and magnetic resonance imaging were invented in Switzerland. Such and similar Swiss innovations are in demand abroad and can also create jobs in branch factories. Cooperation between the state and the private sector (public-private partnership) for such projects favours success. In the same way, Switzerland could benefit from the production of methanol in suitable countries.

The export of technology for plant construction has always been one of the core competencies of Swiss industry. Why should it not be able to develop a network of methanol plants and methanol storage facilities? Here, a challenge is to be demanded from the politicians. Instead of exaggerating the density of charging stations as the key factor for a successful energy and climate change, politicians must ask themselves why their horizon currently barely extends beyond electromobility.

On election day, the climate issue is meaningless

The Swiss militia parliament is being shown the limits in the epochal issue of climate change. Here, MPs usually deliberate climate issues thoughtfully and with moderate expertise. To be sure, almost every parliamentary group in the

Federal Parliament has outstanding heads who strongly influence opinion-forming. In the case of the FDP, it is Councillor of States Damian Müller who, with his proposals, pushes for system-open research into renewable energies and ensures a professional horizon.

In the CVP/Centre, National Councillor Stefan Müller-Altermatt, as President of the Commission for the Environment, Spatial Planning and Energy (UREK), has brought the CO_2 proposal back on track after an initial crash. In the SP, Roger Nordmann, who presented a solar plan for Switzerland with Sonne für den Klimaschutz (Sun for Climate Protection), has been attracting attention for years with his initiatives on climate strategy. Bastien Girod (Greens) had outlined the first vision of a CO_2-free future in 2010 with The Green Change. Jürg Grossen (GLP) is currently on tour with his roadmap for an energy self-sufficient Switzerland.

But the majority of the National Council and the Council of States only get involved in energy debates selectively. Many get lost in the details of the CO_2 or energy law, others simply want to delay measures by ten years or, on the contrary, bring them forward by ten years. All in all, this is not enough to stand up to the Federal Council and the administration on the one hand and the professionally networked organizations of the energy industry on the other.

In the climate debate, it is a decisive disadvantage that today's decisions only affect the next generations. It is difficult to score points with climate policy on the next election day. On the other hand, anyone who campaigns for the enclosure of a section of motorway close to a settlement is almost elected. No one knows this better than the political actors themselves.

Corona is climate change in fast motion

Much of what applies to Covid policies also applies to climate policy: here the scientific community only agrees on the broad outlines; in detail, there is usually a second opinion that contradicts the first. This makes decision-making by politicians considerably more difficult. Many politicians, for example, advocate that the electrification of private transport should be the first thing to be tackled. Andreas Luczak from the Kiel University of Applied Sciences, on the other hand, recommends exactly the opposite for a successful energy transition. For him, electric cars represent one of the most expensive ways to save CO_2 and should therefore be taken up at a late stage.
Analogous to Covid-19, the scientific findings for a successful climate change are never consistent over time. New aspects, additional needs and unexpected solutions are constantly emerging. The patterns of energy consumption are unlikely to remain constant over 30 years. Climate change is therefore massively increasing the demands on government, parliament and administration. Without becoming more technically competent, Swiss politics will hardly be able to keep to the roadmap for decarbonisation according to the Paris climate summit.
The parallels to Corona virus can also be a warning: Several EU member states are developing a pronounced egoism in the pandemic: protective masks were arrested in transit countries and vaccination doses are used for political intrigues. If there is a need for green energy in Europe, then every country will be glad not to have missed out on corresponding developments in its home market.

Lobbies mobilise

As claimed for digitalisation, climate change is also credited with creating a significant amount of work and earnings. This is precisely what the industry wants to be better informed about than it is today. It also makes its approval of measures and laws dependent on this. The replacement of oil and gas heating systems in buildings alone will trigger a massive volume of work.

Calculated from today, 150 heat pumps need to be installed in Switzerland every day in order to achieve net zero CO_2 in this sub-sector by 2050.

Because politicians are still unable to provide reliable information about the employment effects of climate change, representatives of the solar industry are currently filling the gap. They predict 1,400 additional jobs for assembly workers and 2,500 jobs for photovoltaic planners. Such lobby organisations like to stage themselves as legislators: owners of properties with suitably exposed roof surfaces for solar systems are to be obliged to install photovoltaic systems. Otherwise, penalties would have to be paid. Here, politics reveals gaps in information and legislative no-man's land that specific interests are now seizing.

The gas industry also wants to re-enter the discussion through gas-fired combined cycle power plants. Under the label CCS (Carbon Capture and Storage), it wants to recapture CO_2 that has already been produced and store it in deep, saline, water-bearing rock layers.

The parallels of this concept to the unresolved question of the final storage of nuclear waste are obvious. The fact that ETH's think tank SUS-LAB is committed to this backward-looking technology may come as a surprise.

Expectations of politics

Conclusions in the sixth year after the entry into force of the Paris Climate Convention: Swiss politics is actively dealing with the degressive CO_2 roadmap of the summit and has created an effective instrument with the CO_2 Act [link to article]. However, the pace must be clearly increased and the will to implement must be more pronounced. After all, CO_2 emissions in 2019 have hardly fallen compared to 2018. The difference compared to the

reference year 1990 is 14 percent. According to the Kyoto Protocol, however, it should be 20 percent.

High priority must be given to the storage of energy and the future emergency supply of energy to the country. The transfer of technology abroad in exchange for renewable and storable energies must be addressed in a politically targeted manner together with the Swiss economy. The qualities of innovative Swiss industry must be better utilised for the benefit of climate change and realised in public-private partnership projects. The outcome of the consultation on the energy law to be revised will show whether politicians have learned their lesson in the meantime.

Incidentally, the winter electricity gap is not a recent discovery. As early as 1889, the Troller brothers from Littau, mentioned at the beginning of this article, built a steam boiler and two piston steam engines in addition to their water-powered electricity generators in order to be able to supply sufficient electrical energy to the city of Lucerne during the winter period when there is little precipitation.

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