

Media information

The CO₂ content in Swiss electricity is increasing

Not only domestic electricity production plays a role in Switzerland's climate balance, but also domestic electricity consumption. But this is not adequately recorded.

Over the year as a whole, Switzerland is in a good position with regard to the production of electricity from renewable sources. Because electricity from solar and hydropower has hardly any CO₂ emissions, we can expect a climate-friendly overall balance. However, consumption is at least as important as production. Due to imports and exports, these two factors differ considerably. And the CO₂ content of the electricity consumed is increasing.

Brugg, April 2023 - According to calculations by the Swiss energy start-up aliunid, 55% of Switzerland's electricity production came from hydro, wind or solar power last year. Efforts are being made to expand renewable energies. This suggests that Switzerland has done its homework on climate protection in the area of electricity.

1

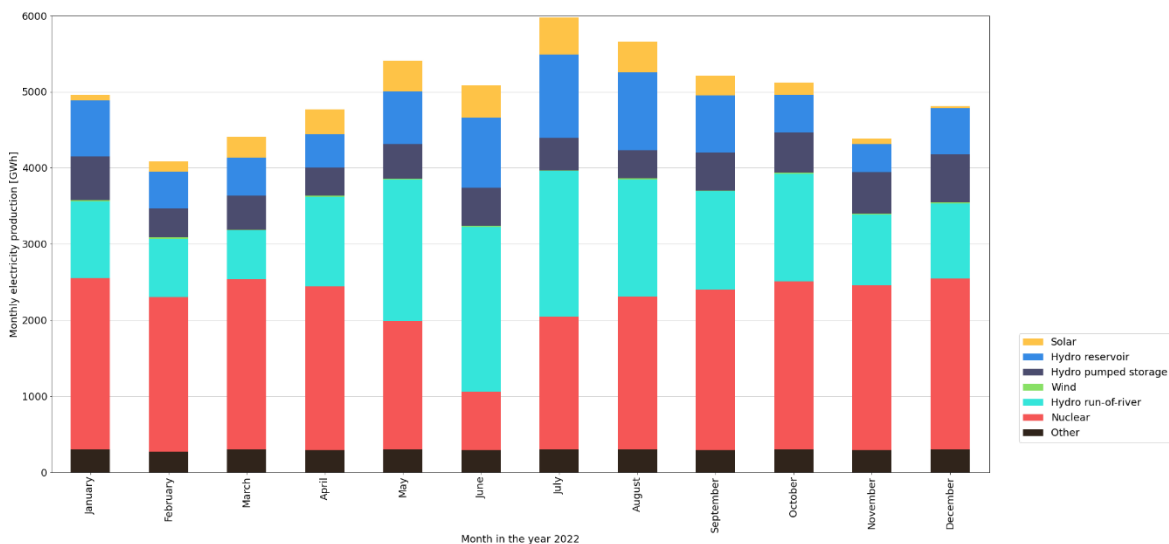


Figure 1 - Monthly electricity production in Switzerland in 2022.

But companies and households in Switzerland do not consume exactly the electricity that is produced. The electricity grid is connected to foreign countries and, depending on whether there is too much or too little electricity domestically, there is an exchange with neighbouring countries. The Swiss energy start-up aliunid has used publicly available data* to calculate the composition of the electricity consumed in recent years. The result: a considerable part of electricity consumption is covered by fossil energy sources.

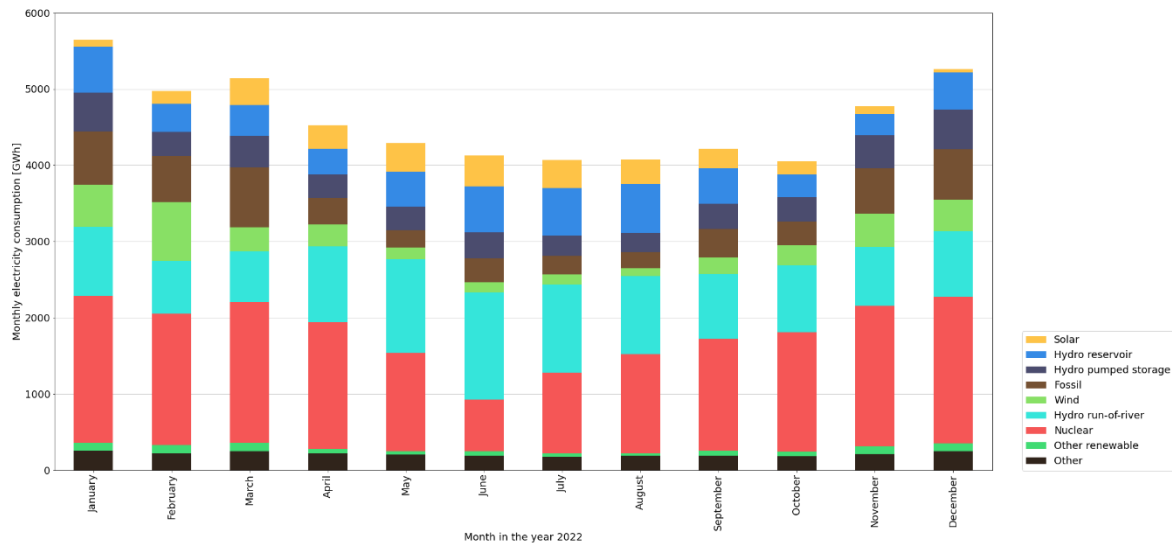


Figure 2 - Monthly final electricity consumption in Switzerland in 2022.

This affects the CO₂ content of the electricity consumed: The CO₂ emissions per kilowatt hour (kWh) of electricity increase. In 2021, the average was 99 gCO₂ per kWh after 71 gCO₂ per kWh in 2020. In 2022, the development continued, with 112 gCO₂ per kWh - an increase of 13% compared to 2021 and an increase of 58% compared to 2020. The absolute CO₂ emissions of Swiss electricity consumption have also increased since 2020. This is largely due to imported electricity from fossil energy sources (Fig. 3).

2

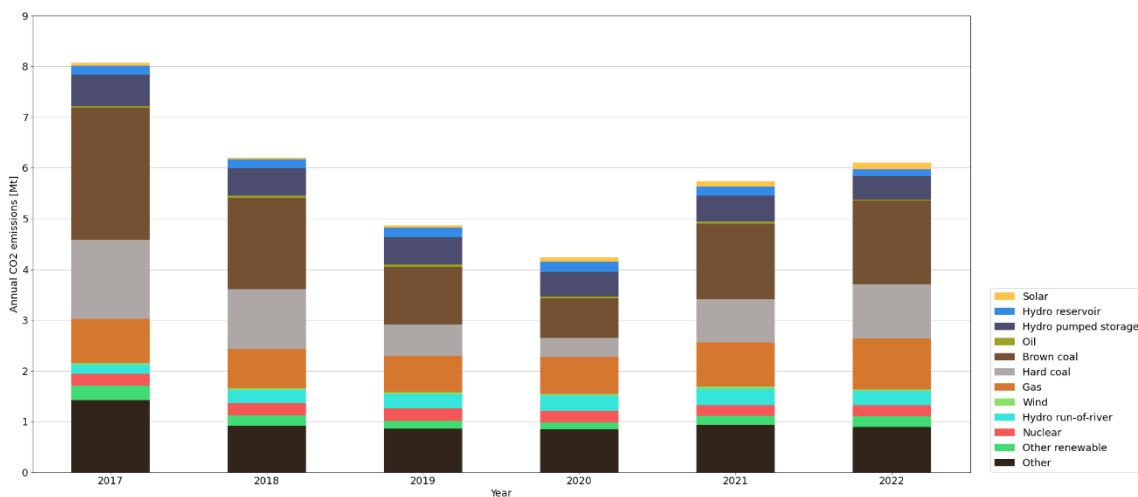


Figure 3 - Annual CO₂ emissions of total Swiss electricity consumption.

What is the reason for the difference between production and consumption?

The electricity produced in Switzerland from flexible hydropower is traded internationally. This electricity is often exported abroad, mostly in summer. When Switzerland has too little energy of its own, such as in winter, it imports electricity. However, this usually comes from fossil and nuclear sources. In addition, companies and households in Switzerland do not only consume electricity when

the sun is shining. As a result, the CO₂ content in Swiss electricity fluctuates considerably over the course of a year, month and day (cf. Fig. 4).

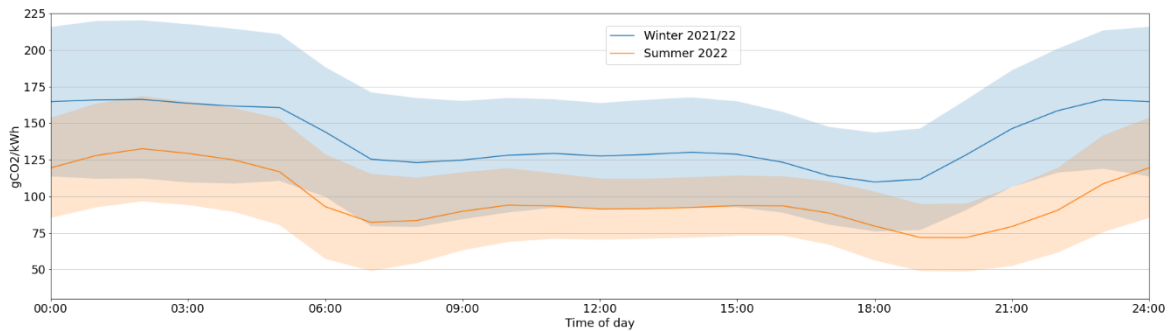


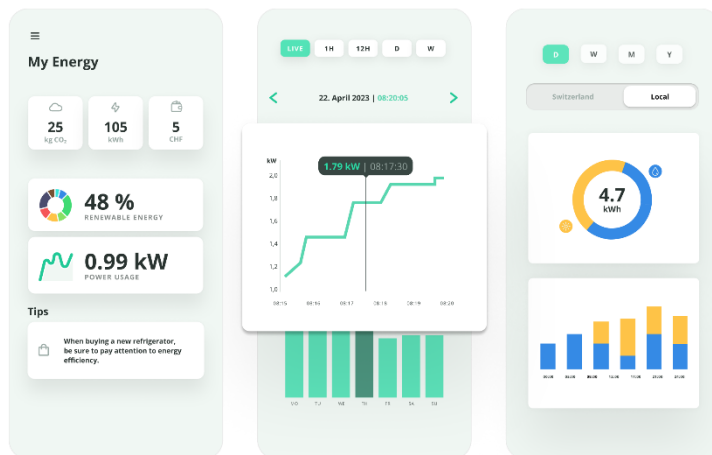
Figure 4 - Average CO₂ emissions in Swiss electricity consumption 2021/2022 over the course of the day.

How can this problem be solved?

A reduction of the CO₂ content in the electricity consumed can be achieved step by step, initially through documentation that is as transparent as possible. This requires up-to-date data - ideally every second. Only when this information is available can production be expanded according to demand and consumption and production can be coordinated.

Guarantees of origin on an annual basis cannot credibly prove that low-carbon electricity has really flowed into a household at all times, because the fluctuations in the electricity mix over the course of a year, month or day are so great. The electricity supplier only guarantees that it has purchased enough certificates in a given year.

Example electric car: A Tesla Model 3 needs 160 Wh per kilometre. This results in 7 gCO₂ per kilometre if the car is charged or operated with solar energy. A Tesla powered by standard Swiss electricity in 2022, on the other hand, produced 18 gCO₂ per kilometre, almost three times as much. A certificate of origin on an annual basis says nothing about the electricity the car was actually charged with on a given day.



Technically, the collection of real-time data from the existing meter infrastructure is possible. The energy start-up aliunid has implemented real-time solutions together with more than 30 energy companies. In the municipalities of Wohlen, Adelboden and Murten, customers can already use a real-time electricity product that transparently proves at any time that the electricity comes from local solar production as well as from hydroelectric power in Valais and Ticino.

Figure 5 - Smartphone application for aliunid's real-time electricity product.

The application also helps end customers save energy, as current and historical consumption is displayed in a user-friendly way on the smartphone. Currently, aliunid is also working with partners, including the Association for Environmentally Sound Energy (VUE), on the certification of an ecological real-time electricity product.

What does this mean for the future electricity supply in Switzerland?

If energy suppliers know the demand profiles of their customers, an optimal, climate-friendly procurement strategy is possible in a supply area. With short-term forecasts, they can optimise their procurement. On this basis, electricity products are created that always deliver climate-friendly energy when it is really needed. In addition, flexibilities in the supply area can be used. Thus, in the medium to long term, real-time data have the positive effect of ensuring that the expansion of domestic energy supply is in line with demand.

The current CO₂ content of the Swiss standard electricity mix can be seen live at <https://www.aliunid.com/strommix>, as well as for the past seven days, 30 days and three months.

**aliunid calculates the CO₂ emissions in the Swiss electricity mix from publicly available sources. Current electricity production (domestic, excluding railway and industrial power plants) and electricity exchange with neighbouring countries are taken into account. The corresponding data comes from the Association of European Transmission System Operators for Electricity, ENTSO-E, and from the Swiss transmission grid company Swissgrid. The basis for the CO₂ emissions of the individual types of production is mostly the latest Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).*

Further information: www.aliunid.com

Contact person for queries:

Dr. David Thiel, CEO aliunid AG

Phone +41 79 379 30 62; e-mail: david.thiel@aliunid.com

About aliunid:

aliunid [all you need] is a digital energy supply company (EVU). The Swiss start-up does not have its own physical infrastructures such as grids, transformers and power plants, but creates value through real-time data, connectivity and its own Swiss Internet of Things (IoT) platform. As a white-label offering for energy suppliers, grid operators and energy producers, aliunid analyses and controls the energy flows from the household to the distribution cabin and transformer to the power plant. This allows the energy system to breathe flexibly, and a renewable, climate-friendly energy supply becomes possible. Dr. David Thiel and Prof. Dr. Andreas Danuser founded aliunid in spring 2018. They bring their many years of experience to an interdisciplinary team of around 20 experts to shape the energy supply of tomorrow. The Swiss start-up was awarded the Energiewende Award 2021 for its commitment and ranks among the top digital providers among more than 1700 energy suppliers from Germany, Austria and Switzerland that were examined.