Audit of the effectiveness of subsidies for large photovoltaic installations

Swiss Federal Office of Energy

Key facts

In order to achieve its targets in terms of energy and climate policy, the Confederation has taken measures to substantially increase electricity production by means of photovoltaics (PV). Photovoltaics are to replace nuclear power as the most important pillar of Swiss electricity production, along with hydropower, by 2050. The production targets for solar electricity have been raised several times, while the measures have been repeatedly modified. Since 2014, the non-recurrent remuneration for photovoltaic installations, designed as an investment contribution, has gradually replaced the cost-covering remuneration for feed-in to the electricity grid (CRF), which has been paid out since 2009, as the most important subsidy for solar power. By the end of 2022, a total of CHF 1.5 billion in subsidies from the grid supplement fund was granted under non-recurrent remuneration for 130,000 PV installations, with an annual production of 2.6 terawatt hours. Furthermore, federal regulations are driving additional financial incentives and the legal possibilities for more solar power plants. These include, in particular, regulations on self-consumption of the solar power produced, on feeding back to the electricity grid operators and on spatial planning. Mandatory PV for new buildings, information measures and federal and cantonal tax regulations, as well as supplementary subsidies from individual cantons and communes, also have an impact on the increase in the number of solar power installations.

Focus on better coordination and cost efficiency in exploiting solar power potential

The Swiss Federal Audit Office (SFAO) examined whether the non-recurrent remuneration, in conjunction with other measures, is suitable and sufficiently coordinated to exploit the existing solar power potential to meet the Confederation's energy policy objectives as effectively and economically as possible. In particular, the role of large PV installations was considered.

The SFAO views the strong growth in PV construction over the past three years as positive and in line with the objectives. However, it identified various risks to achieving the long-term objectives by 2050. The SFAO made five recommendations to the Swiss Federal Office of Energy (SFOE). These relate to the use of existing PV potential, the coordination of financial incentives in favour of solar installations, the design and use of the legal framework for solar power plants on unbuilt land, the monitoring of economic viability, and specific simplifications to the non-recurrent remuneration.

Ensuring the sustainability of the current construction boom in solar installations

After stagnating at an average of around 300 megawatts between 2013 and 2019, annual additional PV output rose rapidly from 2020 onwards to around 1,000 megawatts in 2022. This growth occurred in a period with reduced uncertainties regarding the non-recurrent remuneration (drop in waiting lists) and rising electricity prices. The applicable guideline values for renewable electricity generation excluding hydropower for 2020 were achieved

primarily thanks to the increase in PV. It will also be possible to meet the Federal Council's current medium- and long-term targets for 2035 and 2050 if the present rate of expansion continues. In the SFAO's view, the risks to achieving the targets lie in the possibility of falling market electricity prices and from excessive dependence on the use of PV potential on buildings. If more ambitious targets, which have already been discussed in Parliament, are set, this could also make it more difficult to achieve the targets.

Insufficient coordination of financial incentives for solar power production

The various federal legal provisions that influence the financial incentives for PV constructions have so far scarcely been coordinated with each other or with the fluctuating market electricity prices in order to achieve the most effective and economic support possible. This applies in particular to the provisions for non-recurrent remuneration, self-consumption, feeding back and electricity tariffs. The lack of coordination leads to very different levels of profitability for otherwise comparable projects. In some cases, PV projects are not built despite subsidies, while elsewhere similar projects can be operated profitably without subsidies, meaning funding is thus ineffective (deadweight loss). Since 2023, there has been occasional coordination through a higher non-recurrent remuneration subsidy rate for installations without self-consumption, as provided for by law.

Improvements needed in the cost-effectiveness of the subsidy measures

In Switzerland, as in other countries, the production and subsidy costs for large PV installations are significantly lower than for small installations. In the case of the non-recurrent remuneration for small installations with a capacity of less than 100 kilowatts, the subsidy costs per kilowatt of subsidised output have so far been 44% higher than in the case of the non-recurrent remuneration for large installations with an output of 100 kilowatts or more. For this reason, the fact that the PV potential of large roofs is already better exploited than that of small roofs has a positive effect on economic efficiency. However, there is still substantial potential for savings through greater use of large rather than small installations. The cost efficiency of the non-recurrent remuneration could be improved by a stronger focus on the cheaper large installations and more effective measures against deadweight loss, in particular by excluding already profitable self-consumption from the subsidy. The SFAO considers the auctions for the award of certain one-off payments, which were held for the first time in 2023, to be appropriate for all larger installations above a certain threshold in the future.

Clarification of the future role of large solar power plants

In autumn 2022, Parliament already decided on and immediately enacted a significant simplification and special support for the construction of large installations on unbuilt land in the Alps. Due to their focus on buildings, the SFOE and other federal offices involved intentionally hindered rather than proactively exploited the existing legal options for large installations on unbuilt land outside building zones. An updated strategy, which has so far focused on exploiting the PV potential of buildings, is appropriate in view of the increasingly ambitious expansion targets and the decisions taken by Parliament in the short term in favour of large installations on unbuilt land in the Alps. In the longer term, until 2050, this should favour a criteria-based, reliable, cost-effective increase in installations that ensures supply security in winter.

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