



Brighten up your day with solar power

Teaser:

In our IDAF, we analyzed solar energy in more detail. We have taken a leap back in time and looked at the origins and how the current economic boom in solar energy came about and have drawn up a vision for the future.

To make it easier to understand, we have listed the main events in a timeline and key words, and we will then go into these in more detail.

1839: Alexandre Edmond Becquerel discovers the photoelectric effect

1883: Energy generation with solar cells

1905: Proof and explanation of the photoelectric effect

1954: Silicon-based solar cells

1958: Satellite with solar cells

1990: Promotion of solar research

2000: Renewable Energies Act

2017: Switzerland promotes renewable energy

2022: Solar Boom

2050: Roof Sharing / our vision

1839 IN THE PAST:

The physicist Alexandre Edmond Becquerel found the photoelectric impact in 1839. At the point when he analyzed electrolytic cells, he saw that the voltage between the cells increments when they are illuminated with light. This was the initial move towards grasping PV innovation. Nonetheless, Becquerel himself was not yet ready to make sense of this disclosure. [1]

Die Geschichte der Solarenergie - Solaridee.de

1883 IN THE PAST:

The first functioning solar cell was built by Charles Fritts in 1883. The solar cell consisted of the semiconductor selenium and was coated with gold. However, with 1-2% efficiency, it was not suitable for mass production. [1]

Die Geschichte der Solarenergie - Solaridee.de

1905 IN THE PAST:

Albert Einstein published his paper "On a Heuristic Point of View Concerning the Generation and Transformation of Light" and thus for the first time provided a proof and an explanation of the photoelectric effect. According to this, light has particles, so-called photons. These transfer an energy which they can pass on to other particles. This understanding of solar energy laid the foundation for research into solar energy, on which photovoltaics is still based today. [1]

1954 IN THE PAST:

The breakthrough finally came at Bell Laboratories: in 1954, a silicon-based solar cell was presented there. A crack in a silicon sample led to the development of a PN junction, which enables current to flow in the solar cells. Solar cells are still built on this basis today. However, the efficiency at that time was very low: it was just 6%. Modern solar modules, on the other hand, achieve 4-fold values and are becoming more and more effective. [1]

1958 IN THE PAST:

In 1958, Vanguard 1 turned into the principal satellite in space to supply utilize sunlight based cells for its power. The sun oriented fueled transmitter labored for a long time until it conveyed its last messages to Ecuador in 1964. [1]

1990 IN THE PAST:

As a result of the oil crisis and the nuclear accidents at Chernobyl and Harrisburg, photovoltaics was recognized as an important supply branch of the future and research in the field was pushed forward. However, photovoltaic systems were still very expensive to purchase. [1]

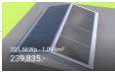
2017 IN THE PAST:

On May 21, 2017, the electorate approved the revised Energy Act. Its purpose is to reduce energy consumption, increase energy efficiency and promote renewable energies. [2]

2022 TODAY:

The Swiss solar industry is booming and has shown in the last two years that it can handle strong growth and that it can advance integration into the power grid with innovative solutions. The call goes out to politicians to quickly remove the remaining hurdles to further growth. Federal Councillor Simonetta Sommaruga said in her opening speech to more than 800 participants: "Never before have so many solar plants been built as now. [3]

Calculation of Today → Coasts and Amortisation

Model	Anlage	Kosten Brutto	Pro Novo	Kosten Netto	kWh pro Jahr	Einspeisevergütung	Ertrag pro Jahr	Amortisationsdauer	Ort
	672 x HQ Energy TMM300	239835	62679.96	177155.04	195000	0.0729	14215.5	12.5	Zürich
	672 x HQ Energy TMM300	239835	62679.96	177155.04	195000	0.13	25350	7.0	Basel
	50 x HQ Energy TMM300	29795	6100	23695	13800	0.0729	1006.02	23.6	Zürich
	50 x HQ Energy TMM300	29795	6100	23695	13800	0.13	1794	13.2	Basel
	20 x LG Solar LG320N1K-	18780	3176	15604	6400	0.0729	466.56	33.4	Zürich
	20 x LG Solar LG320N1K-	18780	3176	15604	6400	0.13	832	18.8	Basel
	99 x HQ Energy TMM300	52665	11098	41567	30000	0.0729	2187	19.0	Zürich
	99 x HQ Energy TMM300	52665	11098	41567	30000	0.13	3900	10.7	Basel

2050 FUTURE:

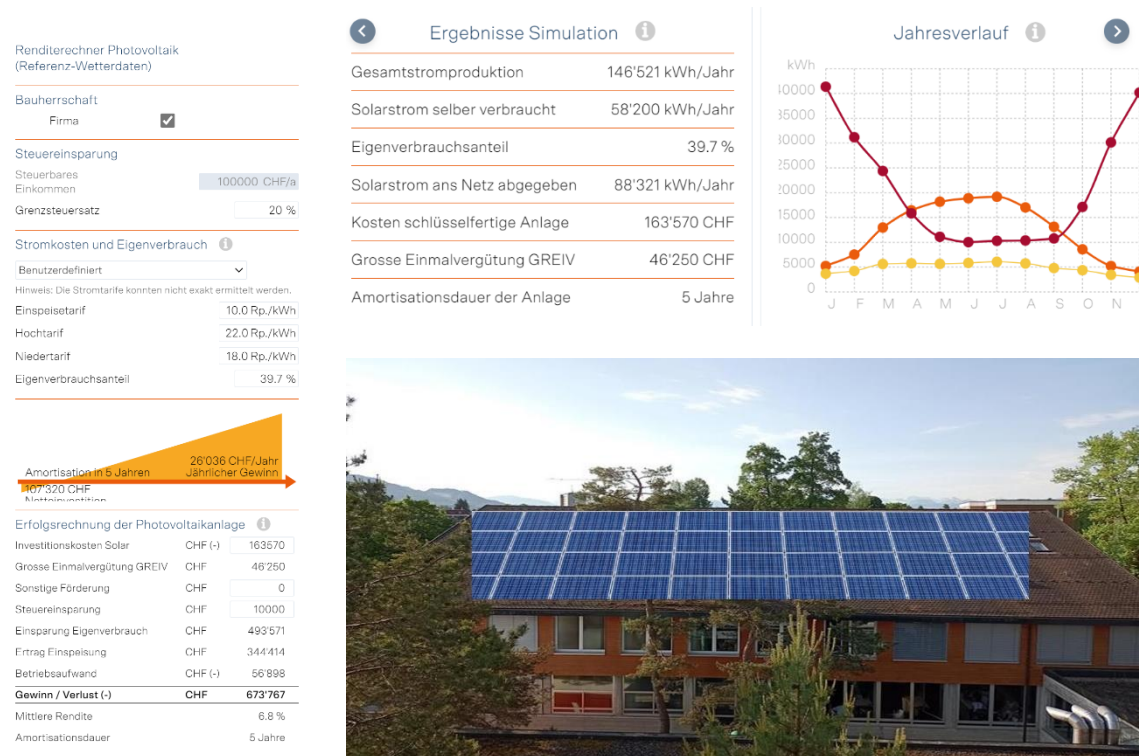
The longer the more we pay not for owning things, but only for using them. The sharing economy is in vogue: more and more people are renting and leasing products and services via online platforms. [4]

Popular examples of this are such as: Airbnb, Uber, clothes renting on the platform Vinted, vehicle leasing/renting ect. there are many exciting possibilities. [5]

According to bfs.admin, 2.3 million households live in rental housing and 1.4 in owned houses and apartments. So about 62% of the population would have no chance at all to invest in solar panels.

Simulation with WKVW:

In the distant future, the Wirtschaftsschule KV Wetzikon (WKVW) could also install a solar array on its roof --> The simulation calculation was calculated with the Solar Calcuator. The following "edited" picture shows the optical aspects. → Solardachrechner [3]



Vision:

It would be exciting if we could rent roofs to create a larger sales market and therefore interest in solar could be created so that the 2.3 million households also have at least the opportunity to be bright by using solar power.

Sources:

- [1] Die Geschichte der Solarenergie ([Solaridee.de](https://solaridee.de))
- [2] Abstimmung zum Energiegesetz - UVEK (admin.ch)
- [3] Photovoltaik wird systemrelevant (swissolar.ch)
- [4] Deloitte - Sharing Economy (deloitte.com)
- [5] Sharing Economy - Vor/Nachteile (lonos.de)

