

Three months pilot project 'PV-Bench 23-24 Mont-Soleil'

First findings and evaluations

Bern University of Applied Sciences, Prof. Dr. Christof Bucher, August 24, 2023



In May 2023, the pilot project for a unique project idea was inaugurated on Mont-Soleil. "PV-Bench" stands for Photovoltaic Benchmark System Mont-Soleil. In the future, various different PV modules will be purchased each year, installed on Mont-Soleil and tested over many years. In the pilot project "PV-Bench" this idea is realized and tested on a small scale. Three months later, it is time to take stock.

Anyone who buys a PV module must rely on the information on the data sheet. It is practically impossible, even for experts, to judge whether a module delivers what the manufacturer promises. As a result, reduced yields are usually only detected after more than one year of operation, and it is not uncommon for it to take several more years to obtain conclusive proof of inadequate module performance. By this time, tens of thousands of identical PV modules may already have been installed on other roofs in Switzerland.

PV-Bench aims to counteract this. On one hand, a publicly accessible quality control should increase and strengthen the confidence of interested PV system operators in the technology. On the other hand, module manufacturers should be motivated to maintain or even increase their often high quality. Finally, products which perform well in public tests are likely to achieve higher prices on the market.

Pilot project holders





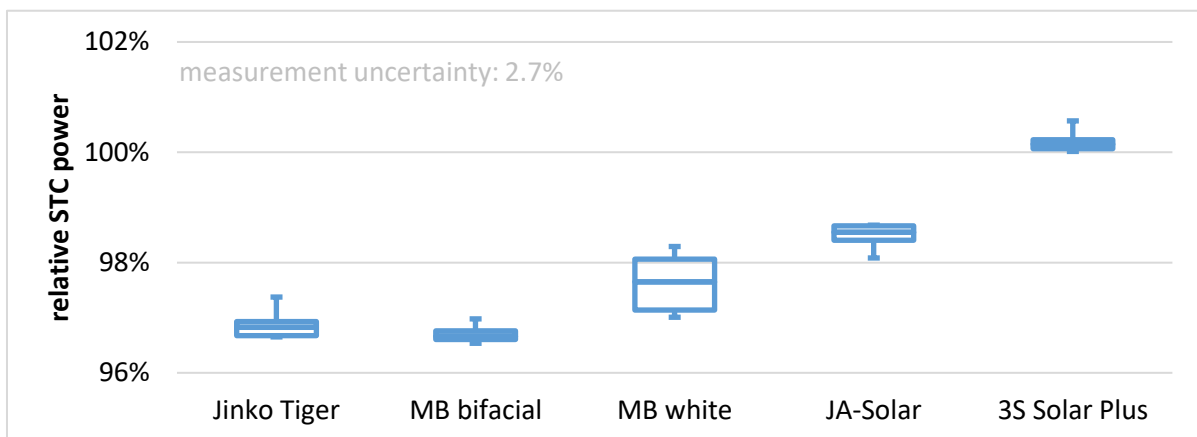
PROJET PILOTE 23-24

pv-bench

MONT-SOLEIL 

After three months of operation, a first conclusion can be drawn:

- All modules tested have an energy yield that is roughly in line with expectations. There are neither outstanding nor disappointing modules.
- The initial measurements of the SUPSI (figure next page) can be confirmed: The PV module "Mega Slate II" is the only one where the manufacturer delivers the promised performance. Accordingly, the energy yield is about 2% higher than that of the other modules.
- The bifacial modules, when the back side is free, bring an additional yield. This depends on the time of day, the season and the weather. In the three months observed, it was between 5 % and 20 %, on average about 10 % of the total energy yield.
- Bifacial modules, installed parallel to the roof, do not produce a measurable additional yield.



Initial measurements SUPSI: 10 modules of each type were measured in the SUPSI laboratory. 3S Solar Plus is the only module to achieve the declared power.

Due to the small number of modules in comparison, the measurement results can of course not yet meet the requirements of a market observation. Furthermore however, the pilot project PV-Bench is basically intended to test the feasibility of transforming the PV plant on Mont-Soleil into a benchmark plant.

To this end, the following observations are made and shared today:

- As a medium altitude site (between midland and alpine sites), Mont-Soleil is on average somewhat colder and somewhat sunnier than the midland, but still offers comparable operating conditions to the PV modules. Thanks to the rather steep module inclination, the modules are also mostly free of snow in winter.

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- The existing mounting system follows the non-level terrain. This has no effect on the operation of a PV plant. However, the extent to which this affects the comparability of the modules of a benchmark installation will be evaluated during the course of the PV-Bench project.
- Even the pilot project of PV-Bench shows certain inhomogeneities regarding the irradiation. These are measured during the course of the project and the energy yield of the modules is normalized accordingly to the available irradiation. For example, after the first three months of operation, the top row of modules has an energy yield that is about 1-2% higher than the bottom row of modules.
- The measuring instruments developed by the PV laboratory at BFH were designed specifically for the requirements of PV-Bench. They were initially calibrated with precision measuring instruments. However, their long-term stability is not yet known. This will be evaluated during the pilot phase.

Overall, the PV Bench pilot project is successfully on track. In one year's time, a decision will be made as to whether the project can be continued. Along with the technical challenges, which the PV laboratory of the Bern University of Applied Sciences and SUPSI and EPFL will be faced with in the coming months, project financing in particular will be a key feasibility criterion.

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