

SMART SOLUTIONS FOR EXTREME CONDITIONS

- **a new way to use PV on flat roofs
and rural situations**

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Board member and responsible for research projects**

Solarspar - an innovative grassroots movement

- Founded 1994 as a cooperative, today an association
- 20.000 members in Switzerland, majority < 40 years old
- 80 PV-plants under contract (> CHF 18 Mio)
over 4,3MWp, investment per year CHF 3 Mio
- All projects must be a business
- Contracts with grid owners or suppliers - mostly with feed in, more and more with ppa and internal consumption
- Financed by member contributions and loans from over 550 private investors / average CHF 13'000 in total over CHF 7.8 Mio
- Development projects in Tibet, India, Nepal, Ethiopia, Madagascar, Mexico, Armenia, etc.
- Projects with E-Mobility (Charging systems and payment systems)
- Research projects in partnership with universities and private companies

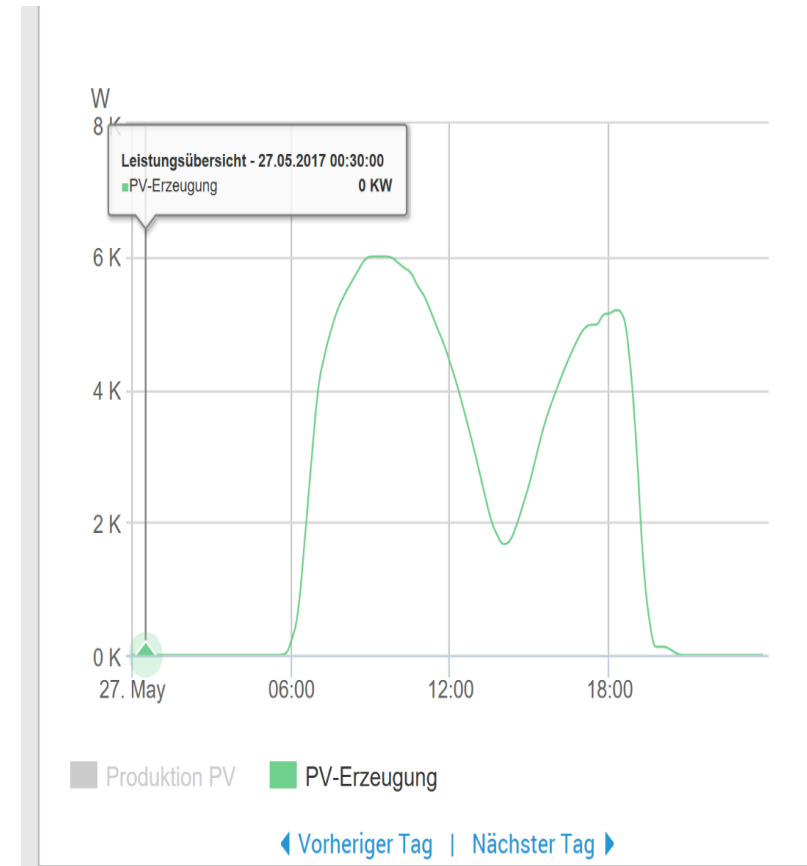
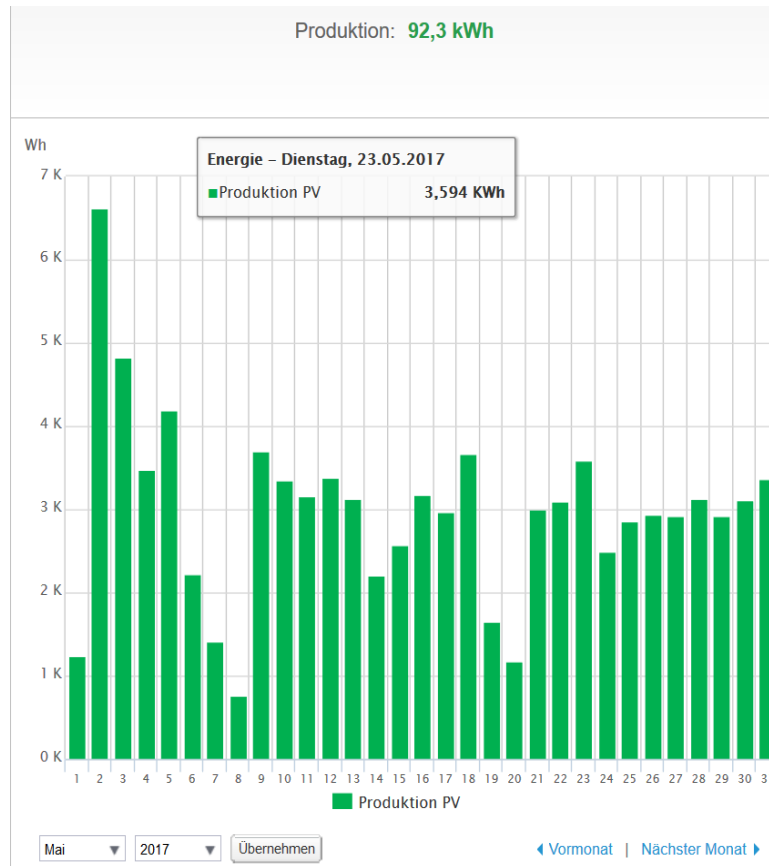
PV-Solutions for extreme conditions and more value usage

Bifacial, vertical installed 20-cell modules



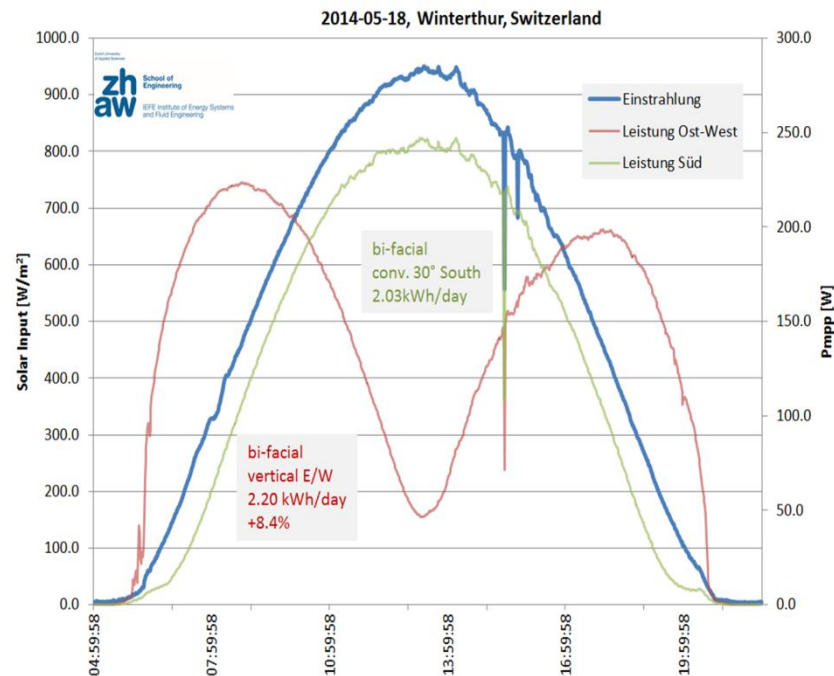
Arosa, Switzerland and planned in Yakutsk, Russia

Albedo effect - influence on production



Advantages:

- less maintenance
- longer period of solar energy production (daily, yearly)



Snow and ... different solutions



Real energy values...per module



Innovative approach by our team for flat roofs:

Bifacial, narrow modules (20 cells) vertically mounted

On a green roof with green benefits:



- rainretention
- biodiversity
- cooling effect in summer
- against urban heat island effect
- noise- and dustreduction
- a “bether” productionprofil
- less maintenance
- dual use



And we have more ideas...pv-agrar...

Many thanks and let's keep in touch!

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