

Photovoltaic Balance of Systems Optimization – Electronics Mounting Costs

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Today three third of the cost share of a single family's roof photovoltaic (PV) installation do not account for the PV module. Three decades ago, it was the other way around. Thus, we see nowadays a lot of innovations in BOS (Balance of Systems) to reduce overall solar kWh electricity costs and reliability. In this presentation steel cable-based PV module mounted for large scale installations, like fishery farms or alpine PV installations, automatically retractable plants and pro and cons of decentralised DC/DC optimizer behind each PV module on partial shaded PV generators will be discussed.

Links:



IEA Report Performance Shaded PV 2024

<https://iea-pvps.org/key-topics/performance-of-partially-shaded-pv-generators-operated-by-optimized-power-electronics-2024/>



Allenspach Baumgartner et al – partial shaded PV, Solar RRL 2022

<https://onlinelibrary.wiley.com/doi/full/10.1002/solr.202200596>



PV youtube Baumgartner

<https://www.youtube.com/@FranzRudolfBaumgartner-PV>

<https://www.youtube.com/@FranzRudolfBaumgartner-PV/posts>



Farewell lecture by Baumgartner, November 2025 – only in German

<https://www.youtube.com/watch?v=TwIFVUKJPIk>

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Franz Baumgartner is Professor of Renewable Energy since 1996 and since 2008 at the ZHAW head of Energy and Environmental Studies and head of Photovoltaic Systems within the ZHAW SOE Institute of Energy Systems and Fluid-Engineering. His research topics are developing innovative measurement techniques of photovoltaic modules, as well as new PV-BOS concepts like mounting structures or magnetic coupling and improving technologies for integration of PV electricity into the grid. Retired since end of 2025.