EPFL STI IMT-NE PV-LAB

Seminar

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MT 2 14.00

Rue A.-L. Breguet 2, CH-2000 Neuchâtel

The cost of PV peak shift

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ABSTRACT

In the last two decades, the losses of most efficient PV inverters on the market were reduced by a factor of nearly ten. Today's word record inverters reach 99% efficiency using the transformerless topologies, for which the development was started about two decades ago. Further improvements of efficiency by using GaN of SiC power semiconductors still have to be proven by economy. The share of costs and the most relevant components in terms of losses are discussed. Bringing more PV power electronics closer to the solar cell, like module oriented power electronic devices to reduce partial shading losses in the PV systems are critically discussed and could emerge as a mainstream technology.

The analysis of the fluctuating PV current feeded into the Swiss network shows, in dynamic analyses of the charge flow, a reduction of the annual solar current production of 8%, when the share of PV current reaches 10% in annual average. The simulations assumed a constant baseload and no significant contribution of wind energy. The use of batteries for electricity saving is still expensive and it is show how it can, in Switerzland, be more advantageously replaced by the pump-hydro storage capacities in preparation. The impact of smart grids, e-mobility or tracking PV on the integration of PV into the Swiss grid will also be analyzed.