

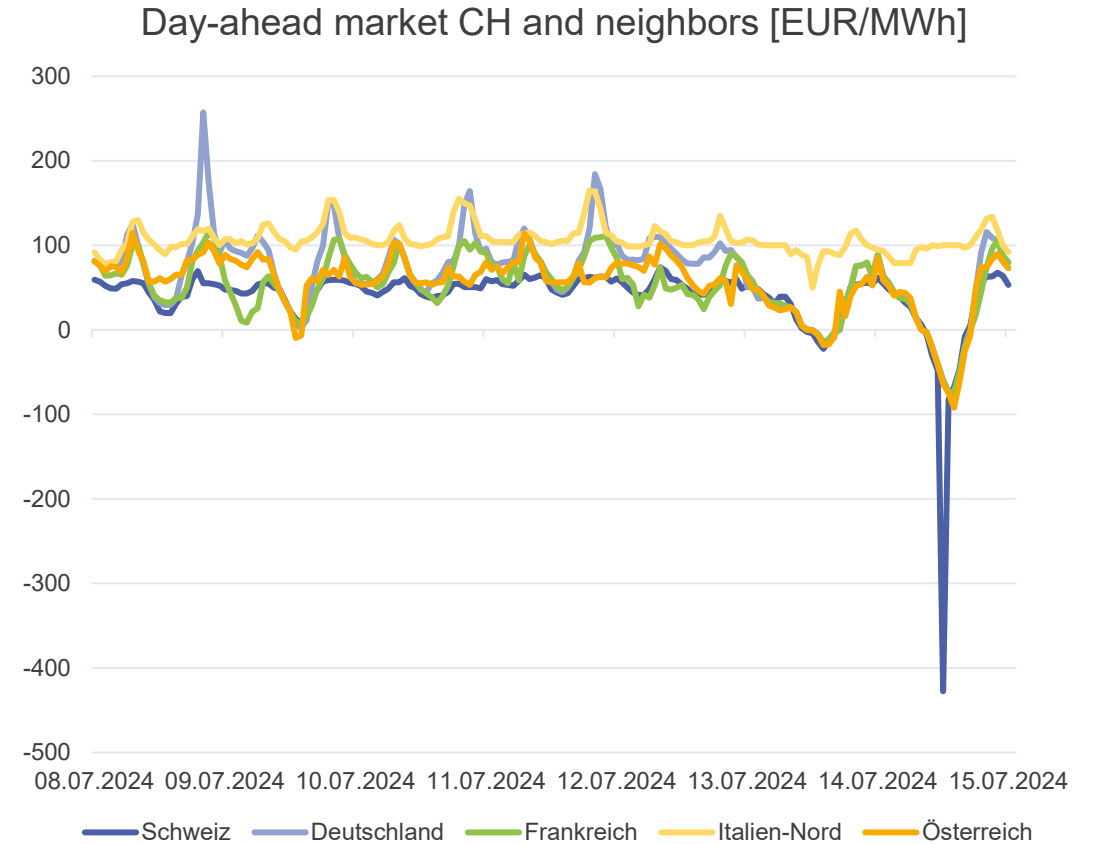
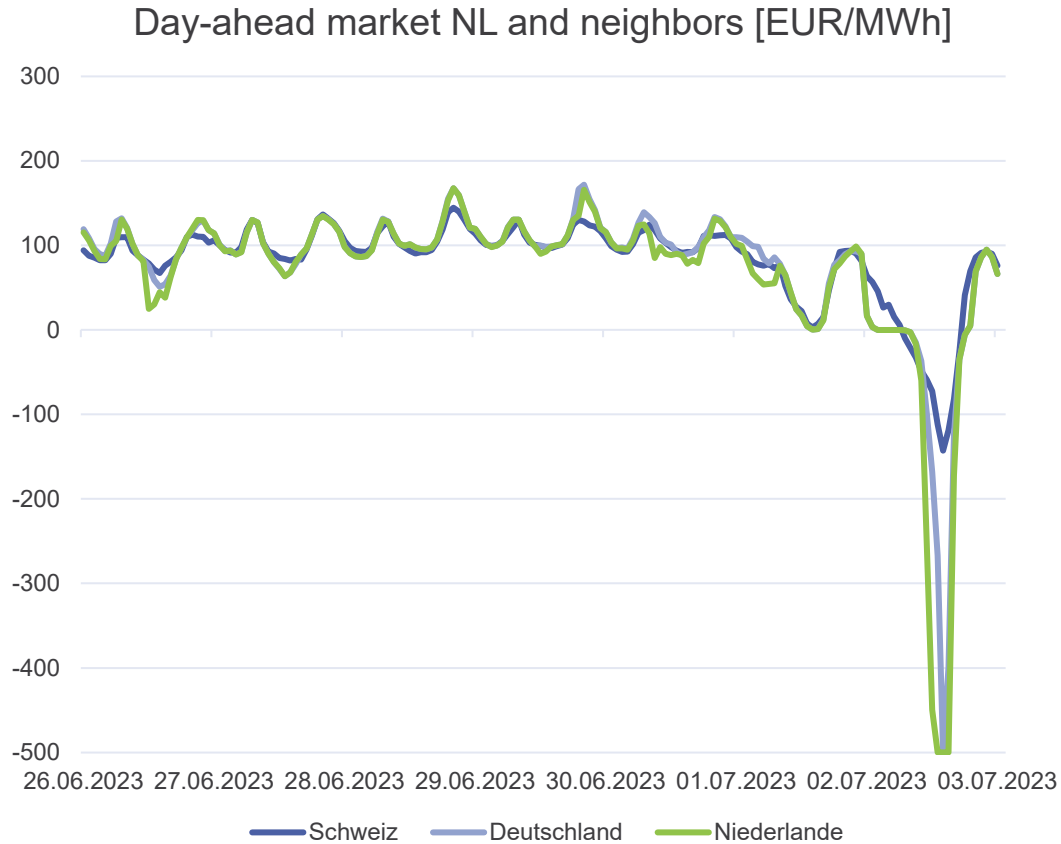


Flexibility for Europe's energy transition





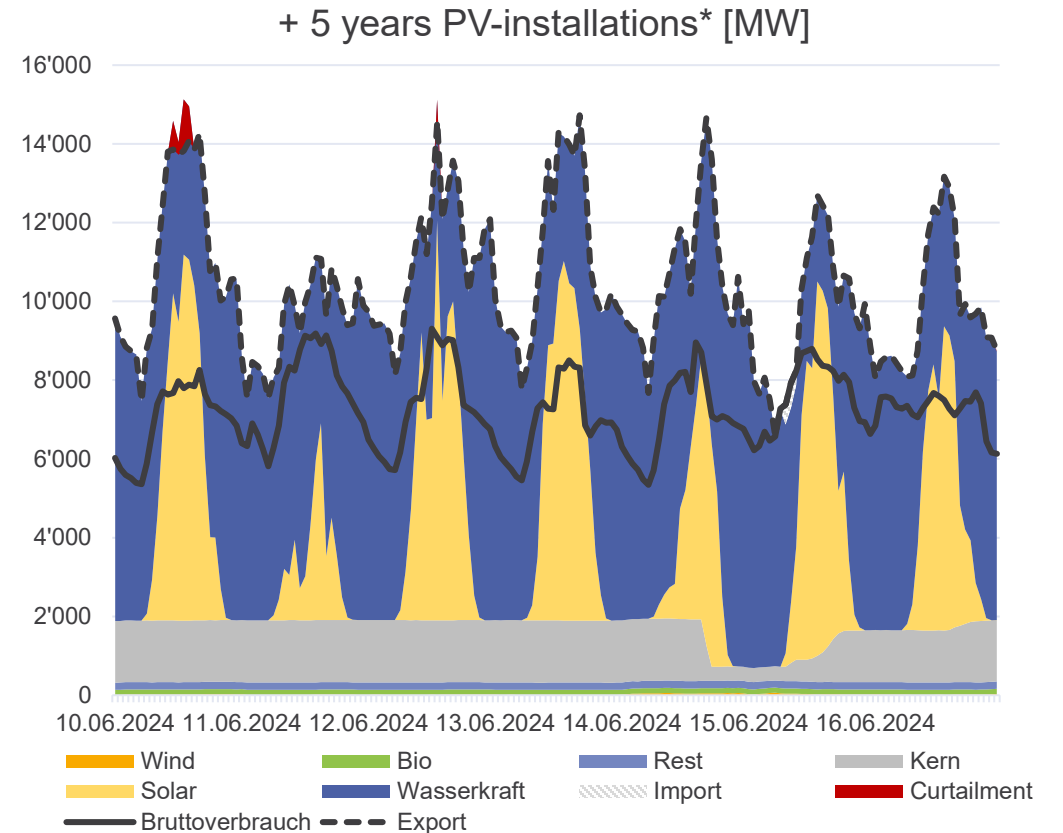
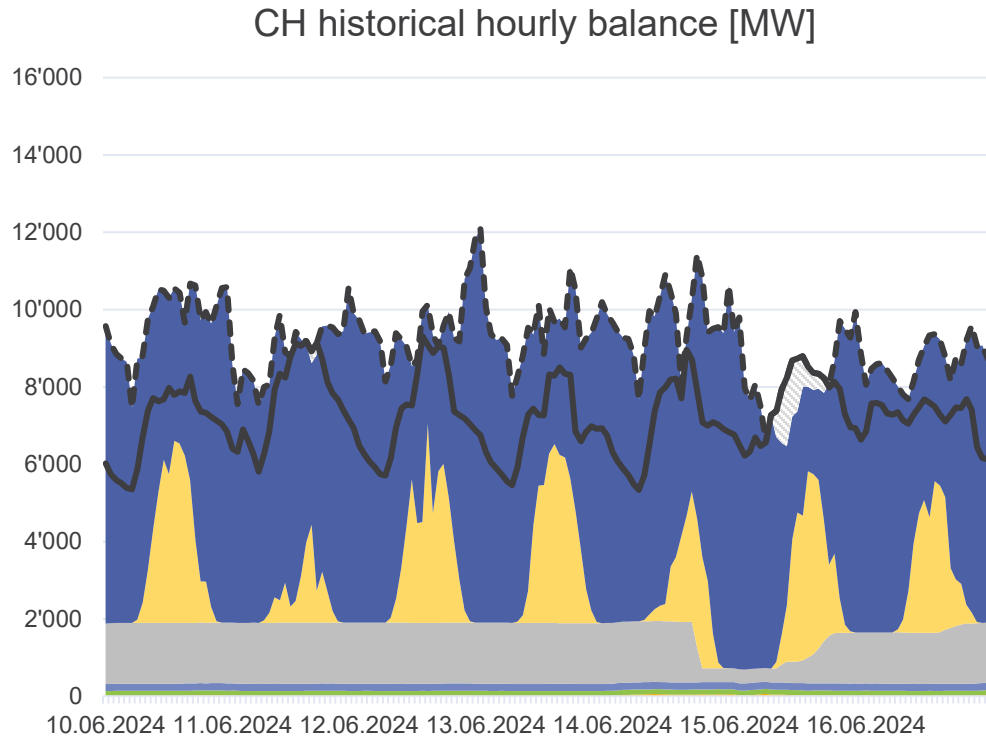
Extreme negative prices through high PV injection



➤ **Extreme prices can currently be contained through operational measures of market participants, but incentives for flexibility become more relevant**



Flexibility will soon become essential due to rapid expansion of PV



➤ **Without additional flexibility, curtailment might soon become a necessity**

*Assumption: 1.5 GW/year
Data basis: Entsoe, BFE



Flexibility tariffs already available

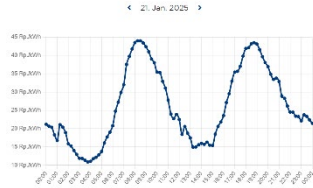
non-exhaustive

Products for grid consumption

Static price steps



Dynamic prices



Premium for external control

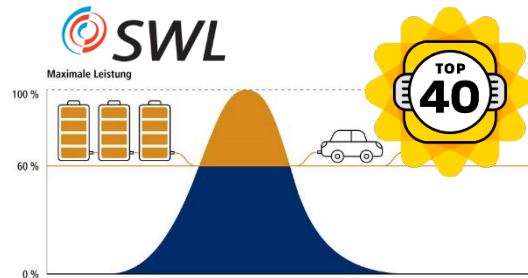


Products for grid injections

Static price steps



Static limits



- **Different concepts**
 - Mostly grid-supporting
 - Static to dynamic
 - Incentives or limits
- **Price differences**
2 to >30 Rp/kWh

➤ **Aim is to reduce total costs in the long term**



Some conclusions/summary

- The energy transition has reached a point where overproduction is becoming relevant
 - Wholesale electricity market provides incentives for additional flexibility
- First flexibility products for end consumers are just emerging
 - Mostly designed for grid-support
 - Strong overlap with market-supporting behavior
- Tariffs are often still designed for the old energy system
 - Grid tariffs
 - Feed-in tariffs

 **Thank you very much for your attention!**

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