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Akkuenergiavarastot energiajärjestelmän tukena

WEC Finland Energian varastointi -webinaari

Björn Nyberg, Solution Manager

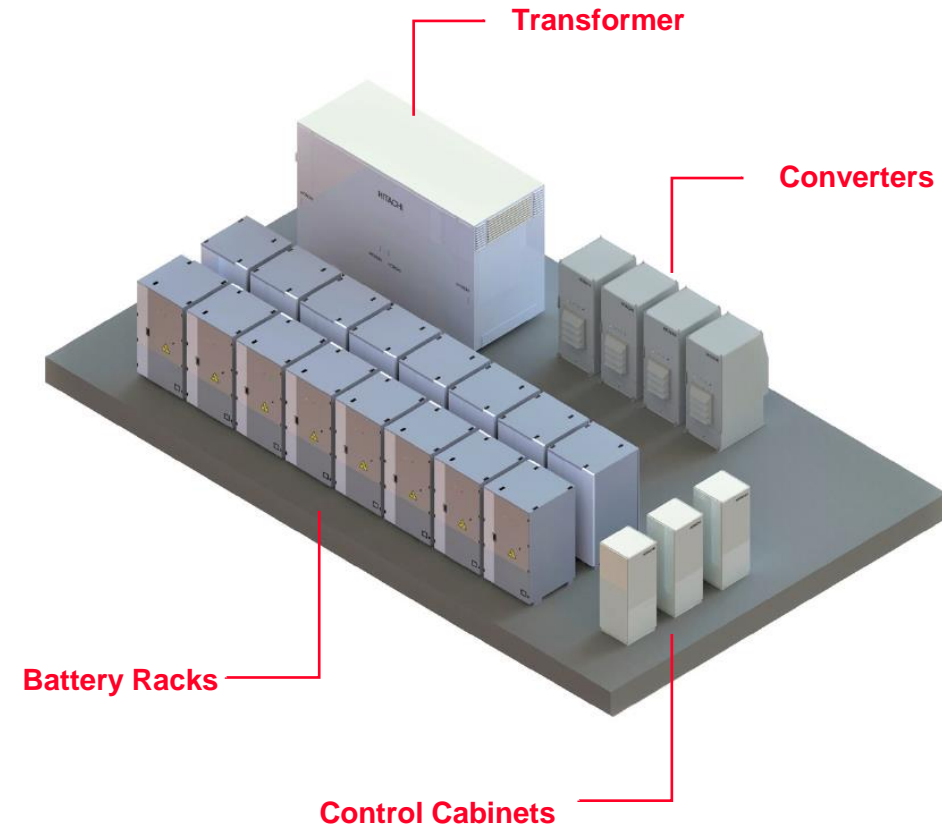
2023-08-17

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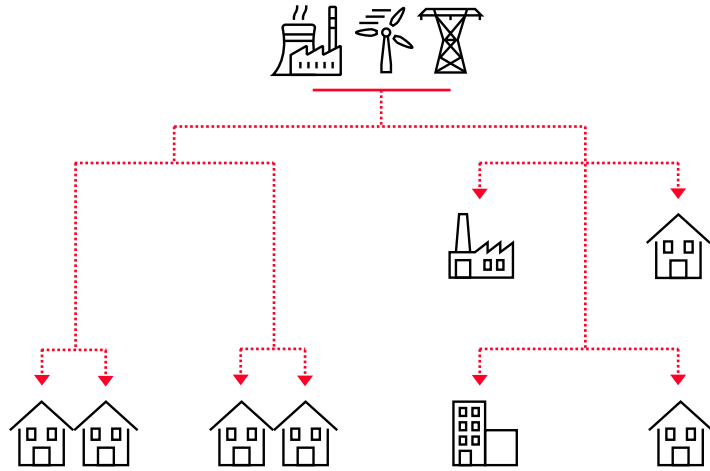
 **Hitachi Energy**

- Stores energy as chemical energy
- LFP batteries most typical technology used
- Typical characteristics of LFP BESS
 - 1C batteries (1h charge/discharge)
 - RTE 80-90%
 - 15-20 years lifespan (depending on usage)
 - Activation time <100ms

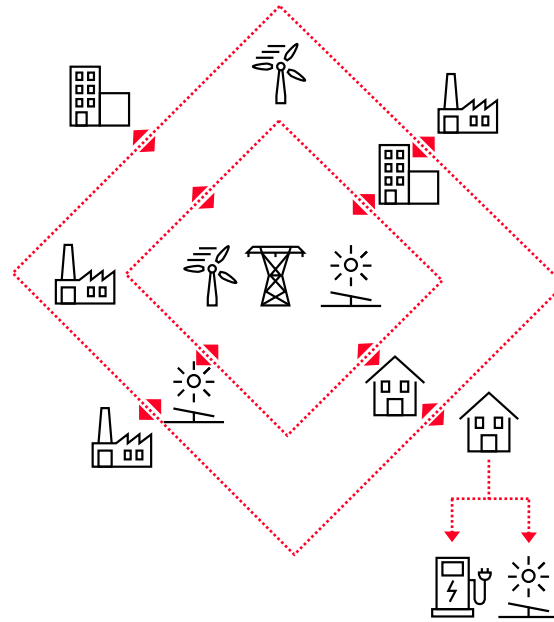
Typical battery energy storage configuration



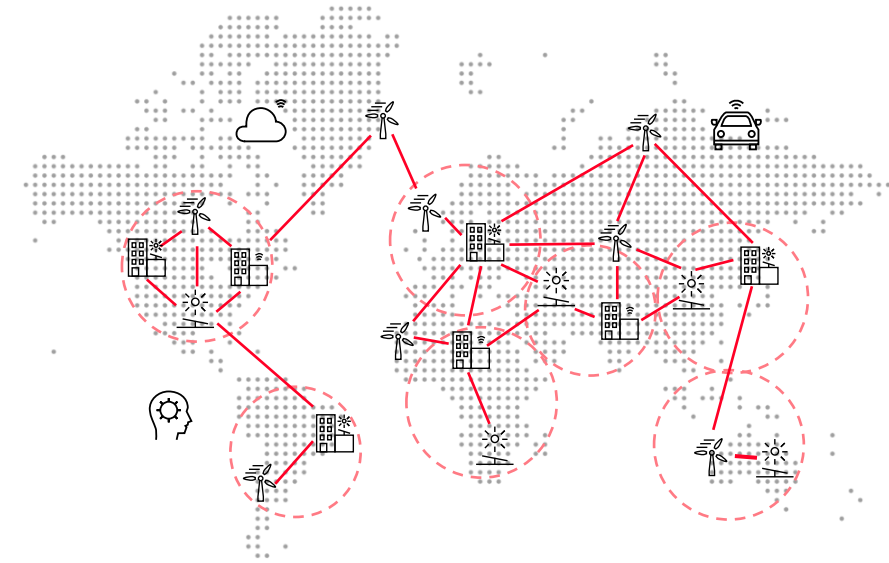
Yesterday



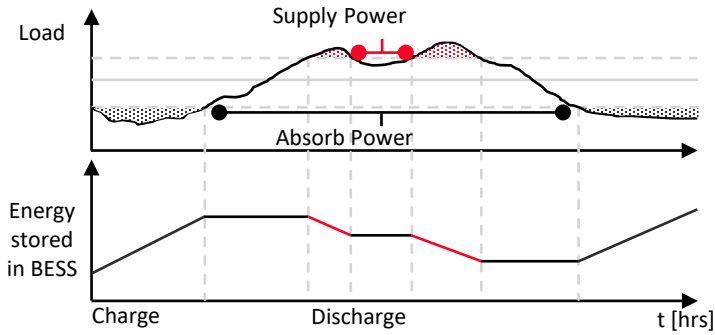
Today



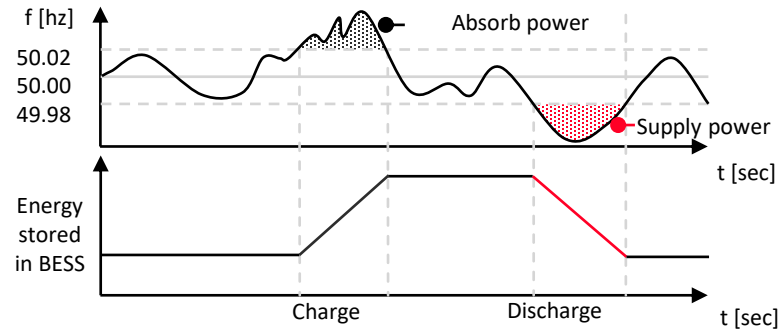
Tomorrow



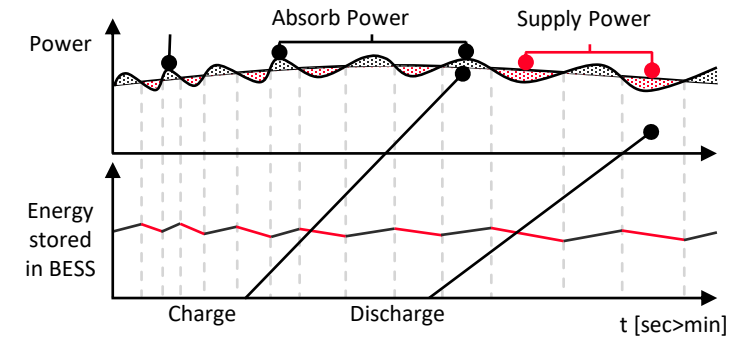
Renewables, grid edge technologies and digitalization drive the evolution of future power systems



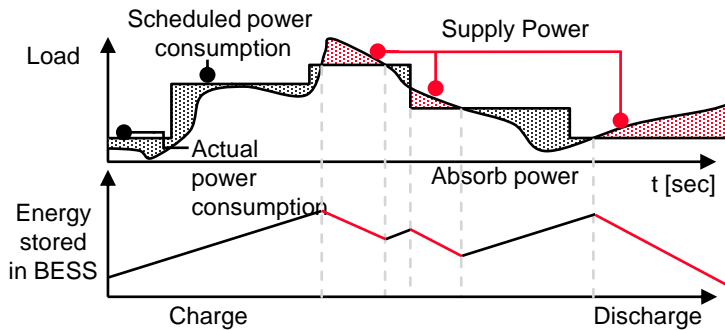
Load leveling



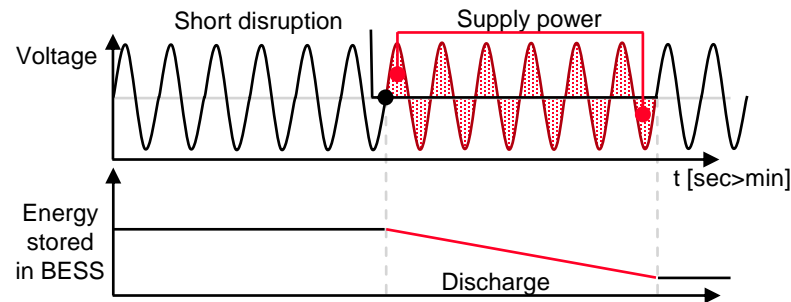
Ancillary services



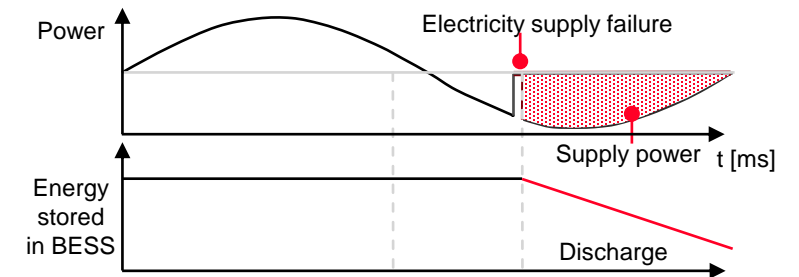
Integration of renewable resources



Peak shaving

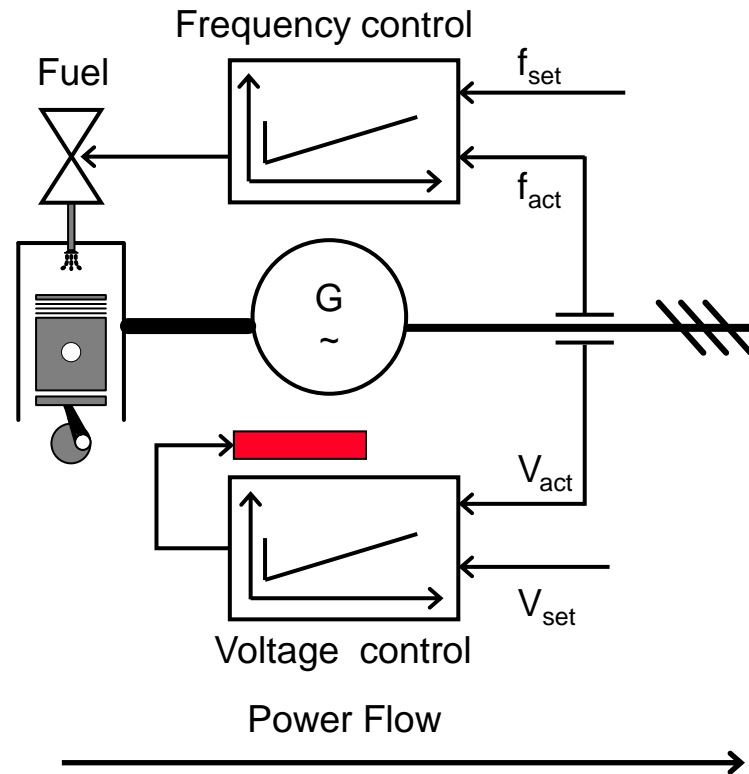


Transition between on- and off-grid

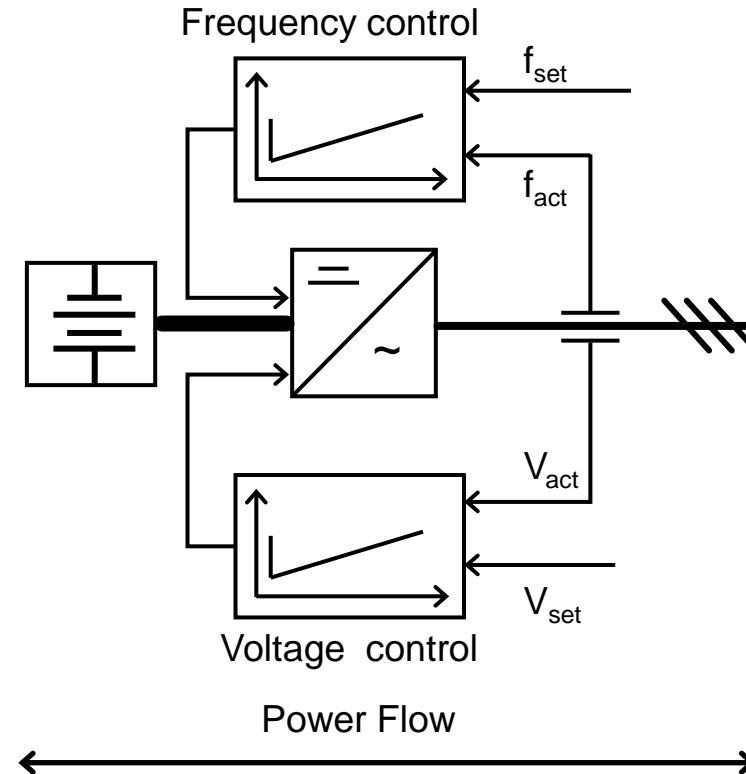


Spinning reserve

Conventional Generator



Virtual Generator



Versatile inverter platform with virtual generator functionality

Wind/Solar

- Curtailment/forecast error correction
- Reserve market
 - Fast reserves
- Grid code fulfillment
 - Grid forming
 - Reactive power compensation
- Auxiliary consumption
- ...

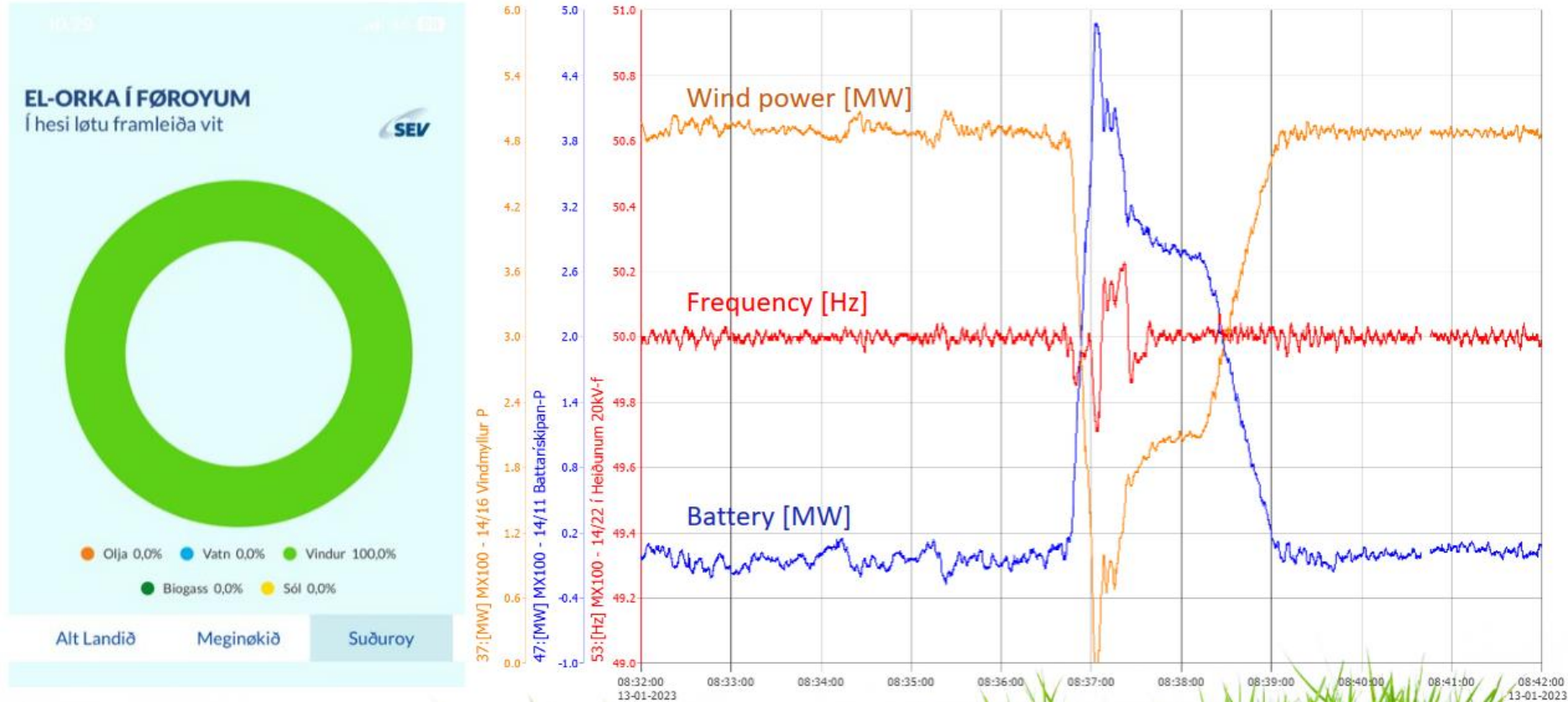
Consumption

- Load balancing
- Peak shaving
- Reserve market
- Grid code fulfillment
 - Grid forming
 - Reactive power compensation
- Short term emergency back-up
- ...

Grid stability (as a service?)

- Short term black-out reserve
- Black start
- Grid forming
- Reserve market
- ...

Control priorities and optimization?



Sudden loss of wind power





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