

November 10th: Use of BESS within high-RES non-interconnected systems

EU and national strategy, policy and regulation

EU Green Deal | Fit-for-55 | REPowerEU

Renewable energy Directive (2018/2001/EU), Electricity Market Directive (EU/2019/944), Regulation on internal market for electricity 2019/943

EU harmonized network codes and guidelines | Network code on requirements for grid connection of generators 2016/631

Planning and forecasting

- Long-term projections establishing the need for BESS on islands
- Scenarios for technology developments
- Critical design choices regarding storage capacity, duration, ownership and alimentation
- Islands' electricity prices today do not necessarily comport the price signals for batteries

Dispatch and balancing

- Energy/grid codes provide the framework for
- Operational practices and hence limitations/rights
- Failure risk management - accepted risk, obligations and control
- Importance of good RES generation forecasting tools

BESS framework

- Different design options for battery auctions
- Connection and permitting rules (testing + requirements)
- Operational requirements and rights
- Control of battery assets (distributed, existing...)
- End of life (replacement, materials)

System flexibility

- Storage
Distributed & centralized
Seasonal & daily
- Intra-day energy smoothing
- Daily or multi-day energy shifts
- Flexibility from consumers/electric vehicles batteries

Grid services for 100% decarbonisation

- Grid services provided by conventional lithium-ion batteries on non-interconnected systems et)
- Grid services that could be provided by BESS connected to grid-forming inverters
- Digitization and visibility/controllability of the system

Investment

Necessary: private investment into third-party batteries, standalone or co-located

Possible: public investment into centralised batteries

Choosing right technologies, locations and de-risking investment



- Costs, revenues and system benefits of storage must be assessed
- Mandatory decentralised batteries were a first step
- Centralised storage is now favoured for grid services, operation flexibility and economies of scale

- Batteries can participate in day-ahead and intraday wholesale markets when they exist
- Batteries partly replacing a thermal generator are becoming quite common, with good feedback

- Private BESS is done via tenders on islands where markets exist
- Operator-owned batteries are more frequent but must follow EU rules
- Derogations to these rules can also be granted by the Commission

- BESS on islands smooths generations first, timeshifts energy second
- Demand-side management is necessary for system flexibility

- Batteries provide great fast frequency regulation as well as voltage
- Black start, inertia and grid forming capacities are coming
- Seasonal storage or firm generation remains needed