INTERNAL

BESS in the Spanish Islands

endesa

Key drivers:

- Potential high curtailment as RES penetration increases.
- Generation mix: aged thermal generation mostly based on oil, not adapted to current flexibility needs.
- Lack of storage capacity.

Challenges:

- Significant security of supply risk in the short term (reserve margin is 10%).
- Need for significant spinning reserve, with several groups required to connect at low load. This reduces room for RES integration, leading to curtailments.
- Regulation: current generation facilities cannot be upgraded or modernized unless authorized by the Ministry following a tender procedure, yet to be launched.
- Price signal (derived from demand, does not consider supply) does not incentivize optimal operation of distributed generation, storage or demand response

Proposed TSO investments in storage in the process of being approved

Maintaining the frequency is challenging, and batteries are especially good at this, rather than RES through curtailment

Solutions:

To modernize thermal generation by hybridization with batteries to provide reserve. The thermal generator does not need to be running since the battery would immediately

inject energy in case of need, covering the time to startup the generator.





Price signal needs to reflect the marginal production costs to provide an efficient signal for operation

Apply EU regulation. Market parties to invest in storage assets as defined in the EU legislation to solve current balancing issues.

Why not developing a primary reserve service to be remunerated?