PJM EMERGING TECHNOLOGY FORUM 2023

Storage as a Transmission Asset

The role of energy storage in optimizing and future-proofing transmission networks

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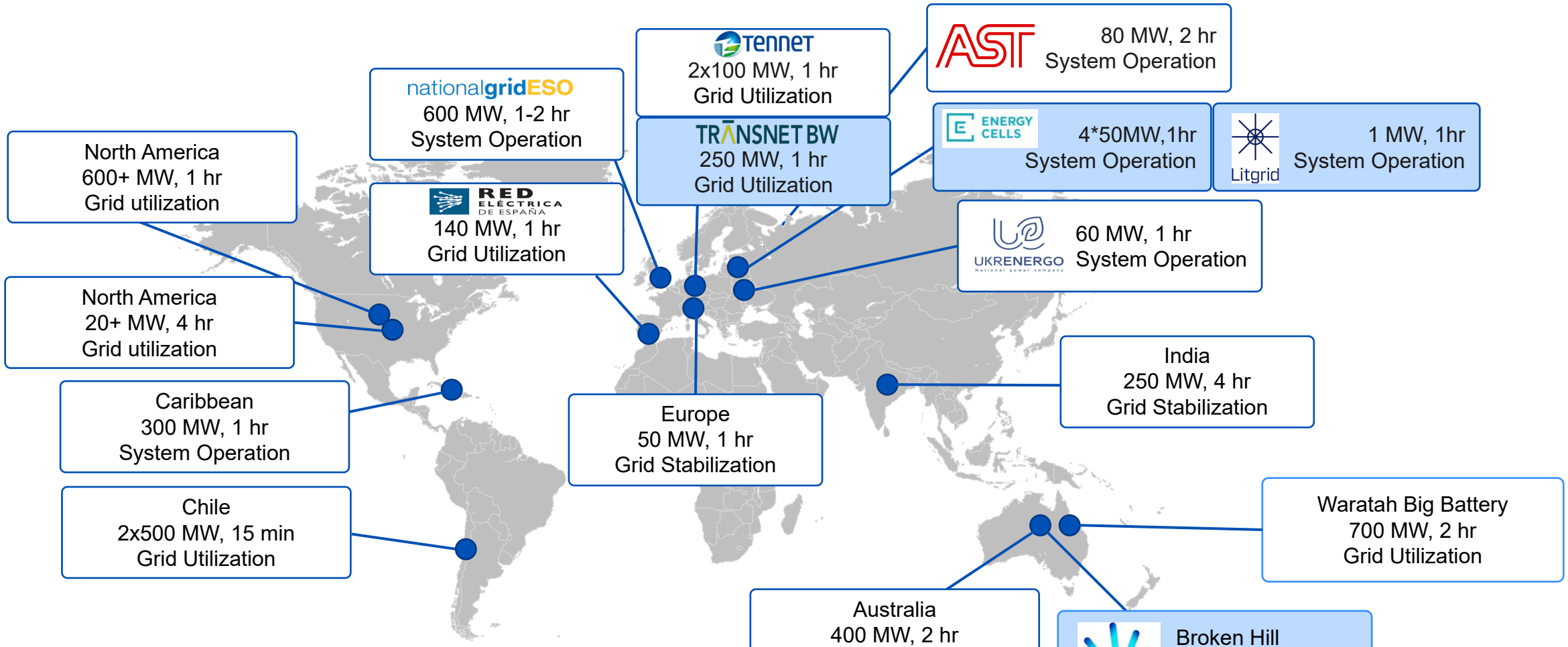
SATA is an early market with huge potential globally

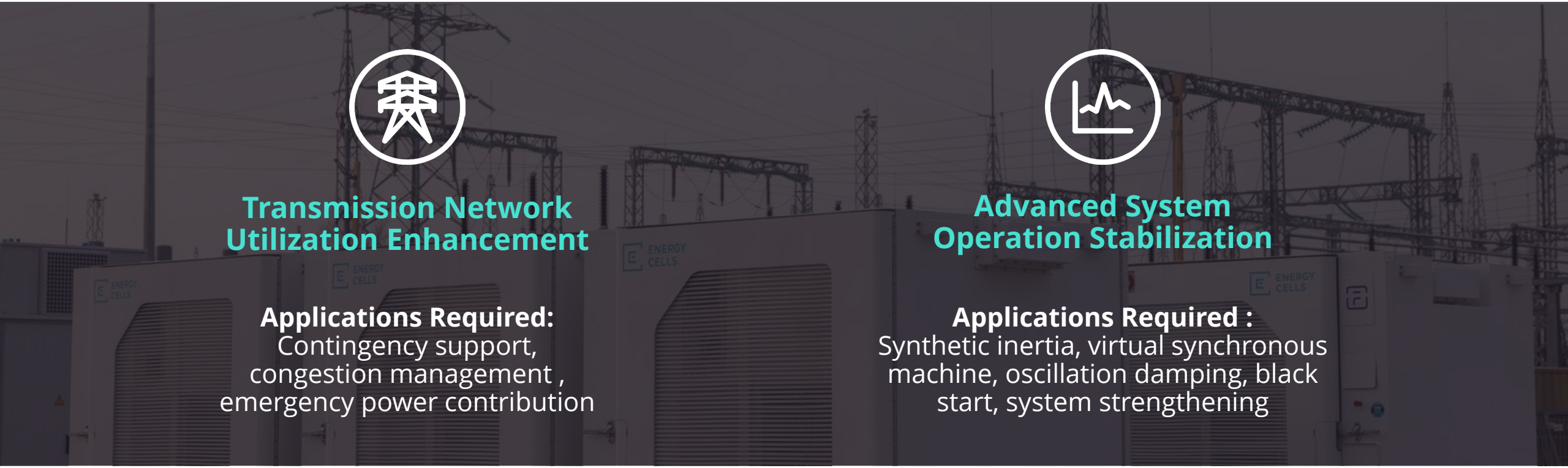
S&P Global forecasts 17 GW /50 GWh of SATA market by 2030



Research group S&P Global forecasts 17 GW / 50 GWh of energy storage systems to be deployed globally through 2030 to enhance or defer investment into upgrading existing electricity network infrastructure

Enabling the Future Grid with Next Generation Energy Storage

Two primary value drivers for System Operators and Network Owners



Transmission Network Utilization Enhancement

Applications Required:
Contingency support, congestion management , emergency power contribution

Key value proposition

Reducing redispatch or curtailment costs and optimizing system-wide dispatch by increasing line utilization

Advanced System Operation Stabilization

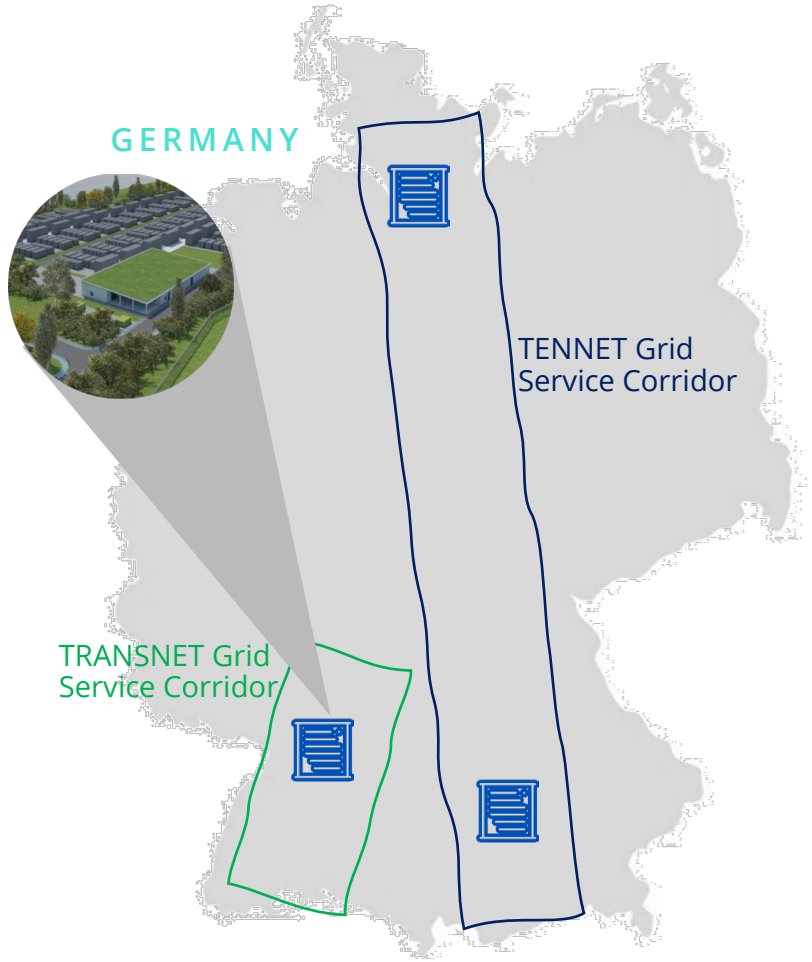
Applications Required :
Synthetic inertia, virtual synchronous machine, oscillation damping, black start, system strengthening

Key value proposition

Providing extensive set of next generation Ancillary Services from TSO owned or operated resources

Global Case Study #1: Network-owned SATA in Germany to increase utilization of existing transmission lines

Fluence is a first mover in the German TSO segment with success at TransnetBW



Projects launched as part of Gridbooster program

TRANSNET BW

Size : 1 x 250 MW / 1Hr
COD : Q2 2025
Project status:
Awarded to Fluence

TenneT

Size : 2 x 100 MW / 1Hr
COD : Q3 2025
Project status:
Govt. Approval in process

Benefits

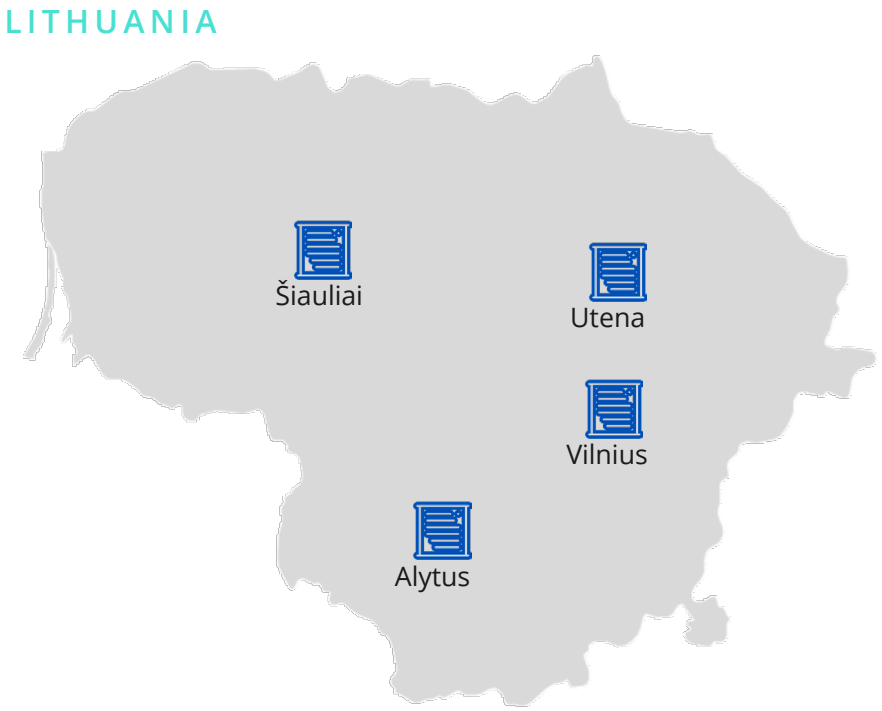
- Reduce need for conventional reinforcement, operating costs & avoid derating of lines
- Ease bottlenecks stemming from moving wind energy from northern Germany to southern load centers
- Overall, reduces re-dispatch costs and lowers end user costs

International experience

- Germany: 450 MW Grid Booster Projects
- Australia: 700 MW Waratah Big Batteries
- Chile: 2 x 500 MW SATA tender

Global Case Study #2: network-owned SATA in Lithuania to benefit from several advanced energy storage services

Enabling Lithuania's renewable energy transition and grid synchronization with the Continental European Network



ENERGY CELLS

Size: 4 x 50 MW / 1Hr
COD: Q4 2022
Project status:
Awarded to Fluence

Litgrid

Size: 1 MW demonstrator
COD: Q4 2022
Project status:
Awarded to Fluence

Platts Global Energy Awards 2022 Winner

THE smarter award 2022 WINNER

Benefits

- Supports disconnection from Russian and connecting with continental Europe synchronous grid area
- Acts as instantaneous energy reserve for Baltic grid
- Started as a 1MW demonstration project. Helps Lithuania pivots towards 90%+ renewable energy by 2050.

International experience

- Great Britain: 600 MW Stability Pathfinder projects
- Australia: 50 MW Broken Hill Project

Storage system co-located at Substations

