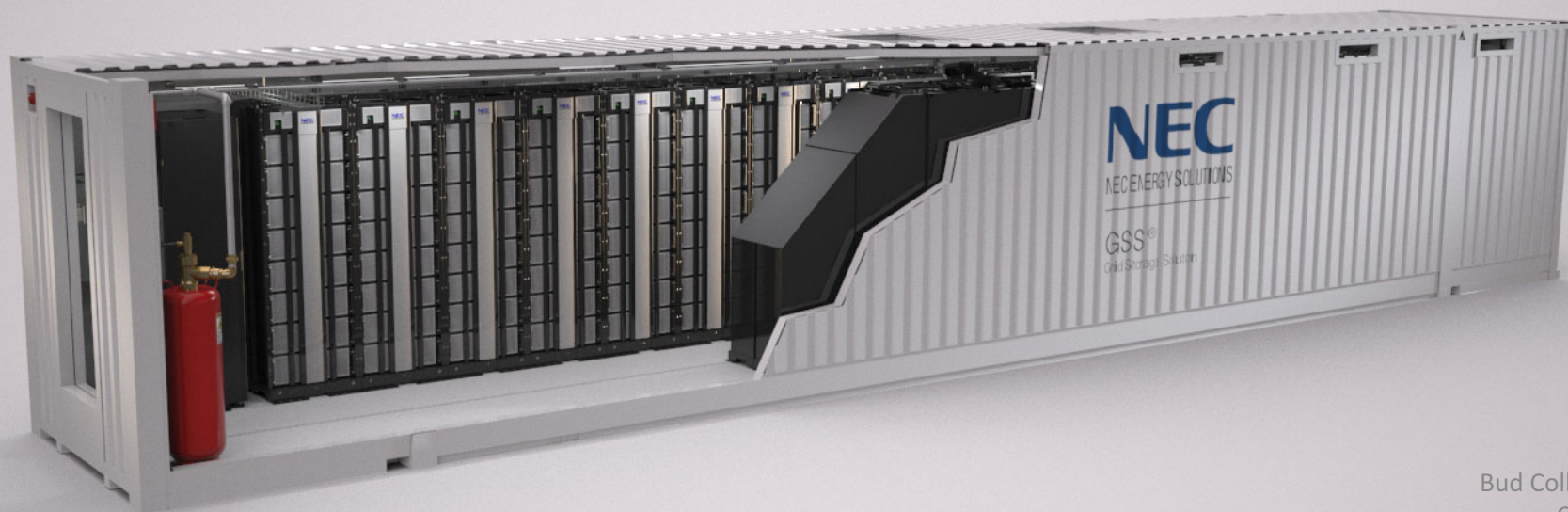


Energy Storage Business Cases



Bud Collins
CEO
NEC Energy Solutions
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About NEC Energy Solutions

NEC Energy Solutions is a full service, end-to-end turnkey energy storage solution and battery systems provider

Offering energy storage products with technical and economic project analysis, installation and commissioning, service, maintenance, warranties and performance guarantees, and vendor financing

About NEC Corporation

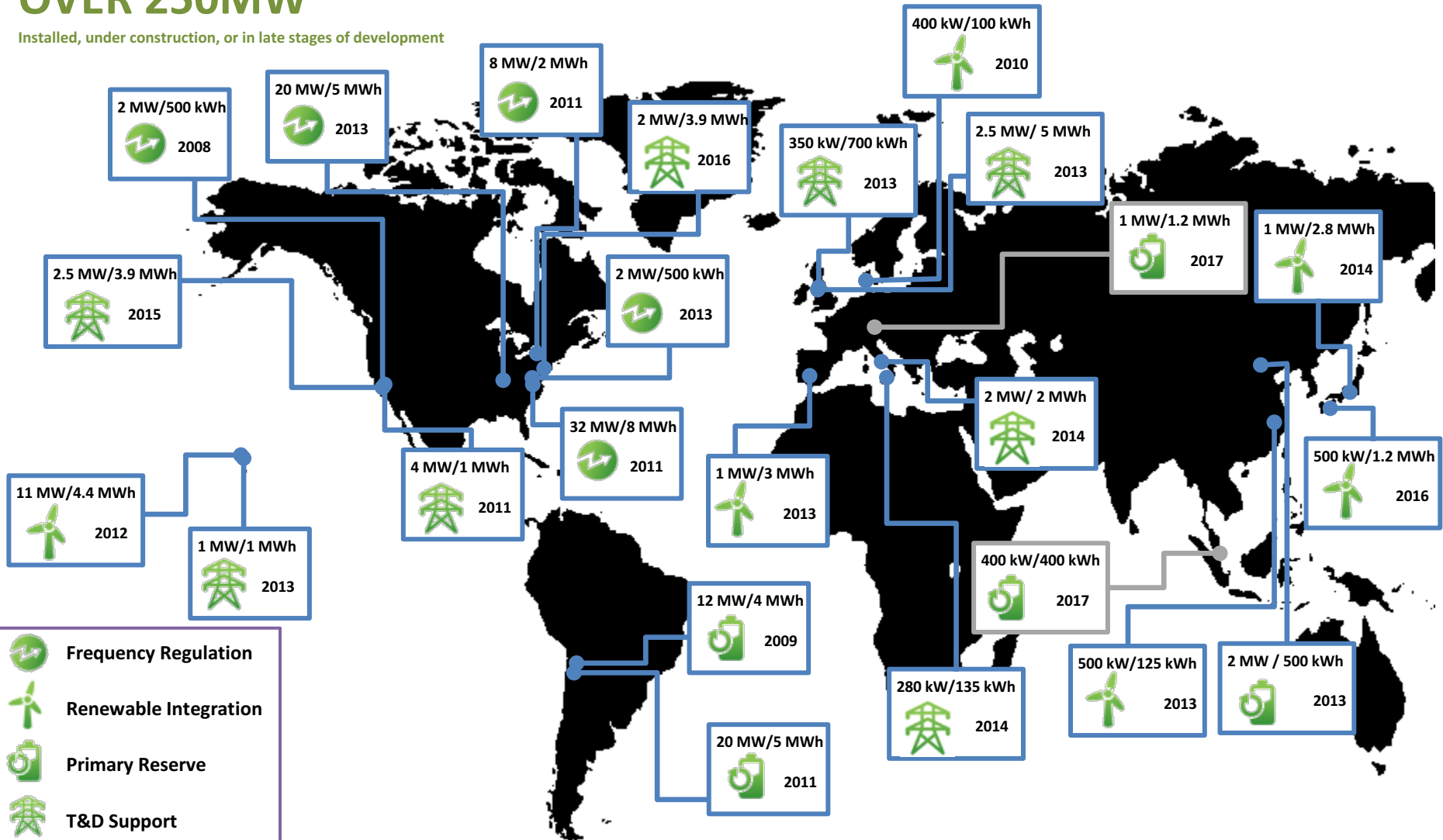
Company Name	NEC Corporation
Head Office	7-1, Shiba 5-chome, Minato-ku Tokyo 108-8001, Japan Phone: +81-3-3454-1111
Established	July 17, 1899
Representative Directors	Chairman of the Board Nobuhiro Endo President and CEO Takashi Niino
Capital	3.5 billion USD (As of Mar. 31, 2016)
Consolidated Net Sales	25.2 billion USD (Fiscal year ended Mar. 31 2016)
Business Domain	Public, Enterprise, Telecom Carrier, System Platform, Smart Energy
Employees	NEC Corporation and Consolidated Subsidiaries 98,726 (As of Mar. 31, 2016)
Consolidated Subsidiaries	217 (As of Mar. 31, 2016)



GSS® Grid Storage Solution Installations

OVER 250MW

Installed, under construction, or in late stages of development



Buy Low Sell High, obviously!
Any questions?

Business cases for energy storage

Buy low sell high, obviously! But if we look past that...

- Providing Value In-the-Grid
 - Ancillary Services
 - Transmission and Distribution
 - Renewable Integration
 - Peaking Capacity
- Providing Value Behind-the-Meter (BTM)
 - Electricity bill savings
 - Managing demand charges or time-of-Use rates
 - Electricity security/autonomy
 - Islanding and backup power
 - Genset, PV, or other DG integration
 - Microgrid
 - Aggregating smaller distributed BTM systems to perform in-the-grid services when not providing value to the host site

About Energy Storage in Ancillary Services

- PJM's Frequency Regulation market
 - It was once the best business case for energy storage in the grid
 - Recent changes in the RegD signal, marginal benefits factor/MRTS, and the institution of a cap have crippled the business case in this market
- Ancillary service markets in other parts of the world
 - UK Enhanced Frequency Response
 - New service for a fast-responding frequency response
 - First 200MW tender winners (all energy storage) were announced in August 2016
 - Four year contract for providing EFR
 - Can provide value in other ways outside just EFR – Triads for instance
 - Central Europe Primary Reserve
 - Germany, Netherlands, Austria, Denmark, Switzerland, Belgium, and most recently France participate in a jointly-procured primary reserve (frequency response) market
 - Business cases for this vary country-by-country but assets all provide the same basic service in the same interconnection and clear on the same market
 - Germany vs Belgium requirements

What does the future hold?

NEC

NEC ENERGY SOLUTIONS