Energy Storage

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Imagination at work
Energy Storage growth has precedent in wind & solar

From 2010 to 2020 marks a 40X improvement in overall ES viability

Sources: EIA, IEA, NREL, GWEC, EPIA, BNEF, Lux, Navigant, HIS CERA, GE Analysis

Solar : PV panel cost

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Energy Storage is a unique asset that provides unprecedented flexibility in grid optimization.

ES provides instantaneous local capacity, & continuous ancillary services with no fuel consumption or emissions.
ES provides **instantaneous local capacity, & continuous ancillary services with no fuel consumption or emissions.**

1. **Curtailed Renewables**
   Additional clean energy into system

2. **Peak Load**
   Reduction in conventional “peakers”

3. **Fast Ramping**
   Enables dynamic capacity

4. **Frequency Regulation**
   Provides 100% of FR with *no emissions* or constraints

5. **Spinning Reserve**
   Provides 100% of SR with *no emissions* or constraints

6. **Maximize Baseload**
   Enables high capacity factor of baseload generation

7. **Reduce Emissions**
   From peak capacity and ancillary services

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Why Battery ES?... *flexible compared to traditional assets*

High renewables cause daily profile issues
... no longer just about energy

- Locational grid benefits
- No air quality constraints
- No local fuel requirements
- Defer wires investment
- Modular & movable
- Quick to deploy (6mo to COD)

Energy Storage flexibility allows optimization of all system assets
Scenario: NYISO at 50% Renewables w/4GW ES

2015 BASELINE  W/O ES  W/ ES
LCOE

$79.44  $85.85  $79.80

2015 BASELINE  W/O ES  W/ ES
CARBON EMISSIONS

64.6  37.4  32.5

15,534 GWh  6,986 GWh

4 DAYS OF OPERATION IN THE SPRING

4 DAYS OF OPERATION IN THE SUMMER

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NYISO at 50% Renewables w/8GW ES

2015 BASELINE | W/O ES | W/ ES
---|---|---
LCOE | $79.44 | $81.02 | $86.71

BENEFIT | COST
---|---
$53 | $86
$145 | $95
$101 | $311
$251 | $0

2015 BASELINE | W/O ES | W/ ES
---|---|---
CARBON EMISSIONS | 64.6 | 46.8 | 33.6

4 DAYS OF OPERATION IN THE SPRING

4 DAYS OF OPERATION IN THE SUMMER

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The utility of the future . . . Is a battery.
Bringing the strengths of GE to Energy Storage

2,000GW+ GE power generation

- Wind
- Solar
- Water
- Gas Turbines
- Nuclear
- Combined Cycle
- Gas Engines
- Power Gen Services
- Aero

GE Energy Storage

- GE Store
- Broad, diversified portfolio
- Long-term, valued brand
- Stable & reliable partner

100+ years powering the world … optimizing our future with energy storage
MW Class ES Platform
Custom solutions from standard, proven building blocks

**Controls**
GE’s Mark VIe Control System has more than 16 million hours of combined operation

**Battery Enclosure**
Standard pre-fab enclosure + additional safety features

**Transformer**
>3.5 million GE Prolec transformers installed

**Inverter**
>25,000 GE Renewables Inverters installed across Wind, Solar, and ES

**DC Block**
Proven Li-Ion chemistry Tier 1 Suppliers with full GE Supplier Qualification

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