

---

# Energy Storage: Prudent, Progressive Power Plant Alternative

September 2012

NASEO Annual Meeting

---



# Batteries on the grid? Yes.

Cells



Vehicle Modules



Trays



Racks



2 MW Grid Units



# Commercial, battery-based energy storage is performing today in power markets.



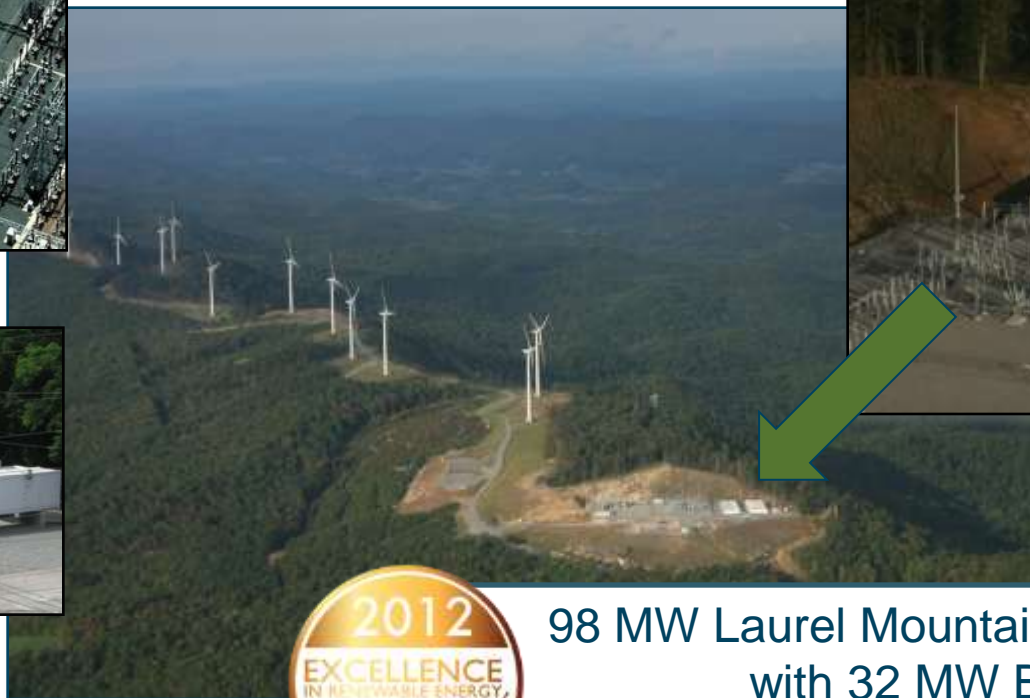
Chile



New York



Chile



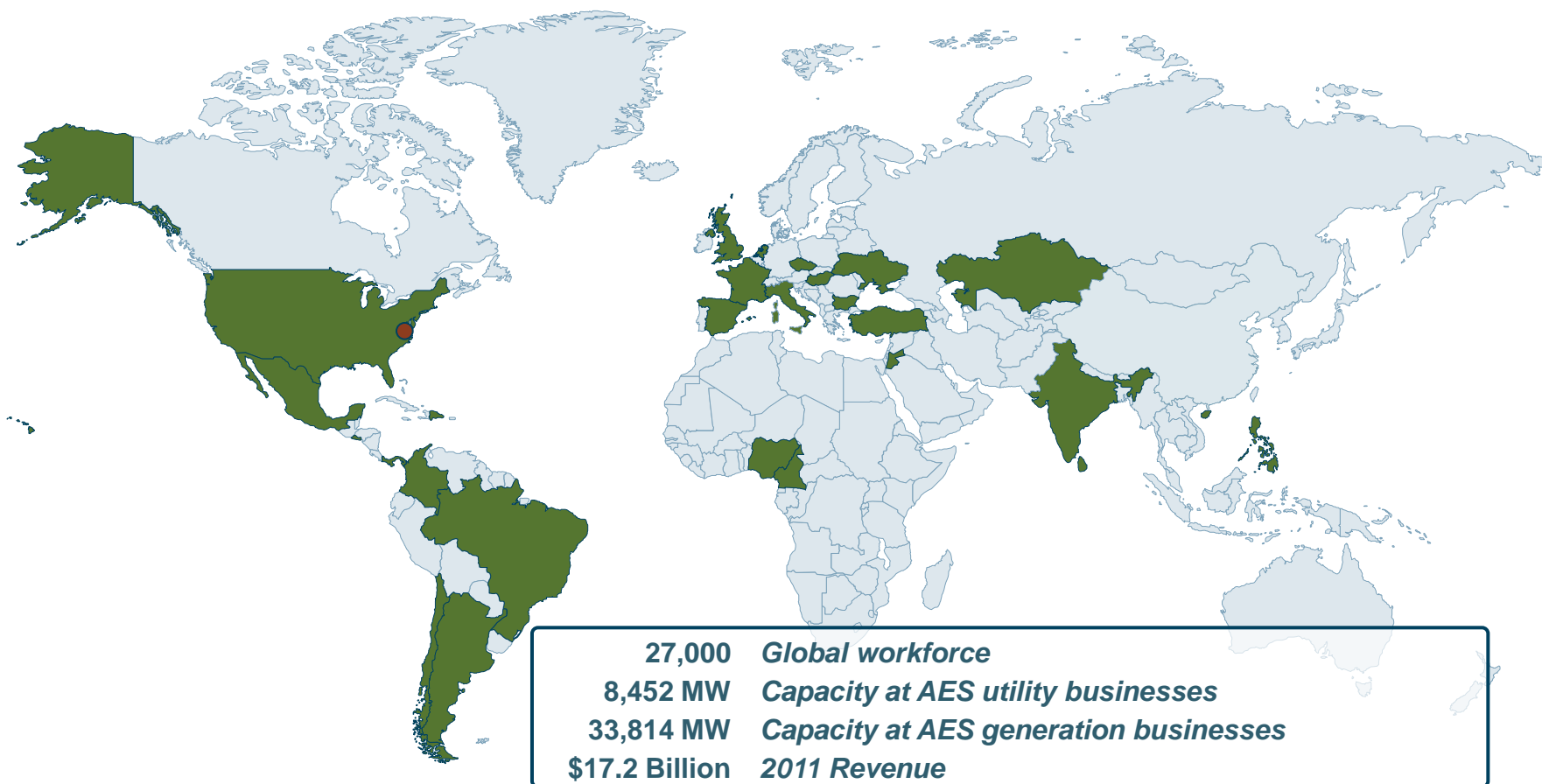
98 MW Laurel Mountain Wind Project  
with 32 MW BESS  
Serving PJM Market

Member:



# AES operates power facilities in 26 countries.

Our mission is to improve lives by providing safe, reliable and sustainable energy solutions in every market we serve.



**Key**

● AES Headquarters

■ AES Operations

AES has been serving utilities with reliability services for 30 years.



## AES Products

Energy

Clean Energy

Capacity (R. A.)

Regulation

Voltage Support

Spinning Reserve

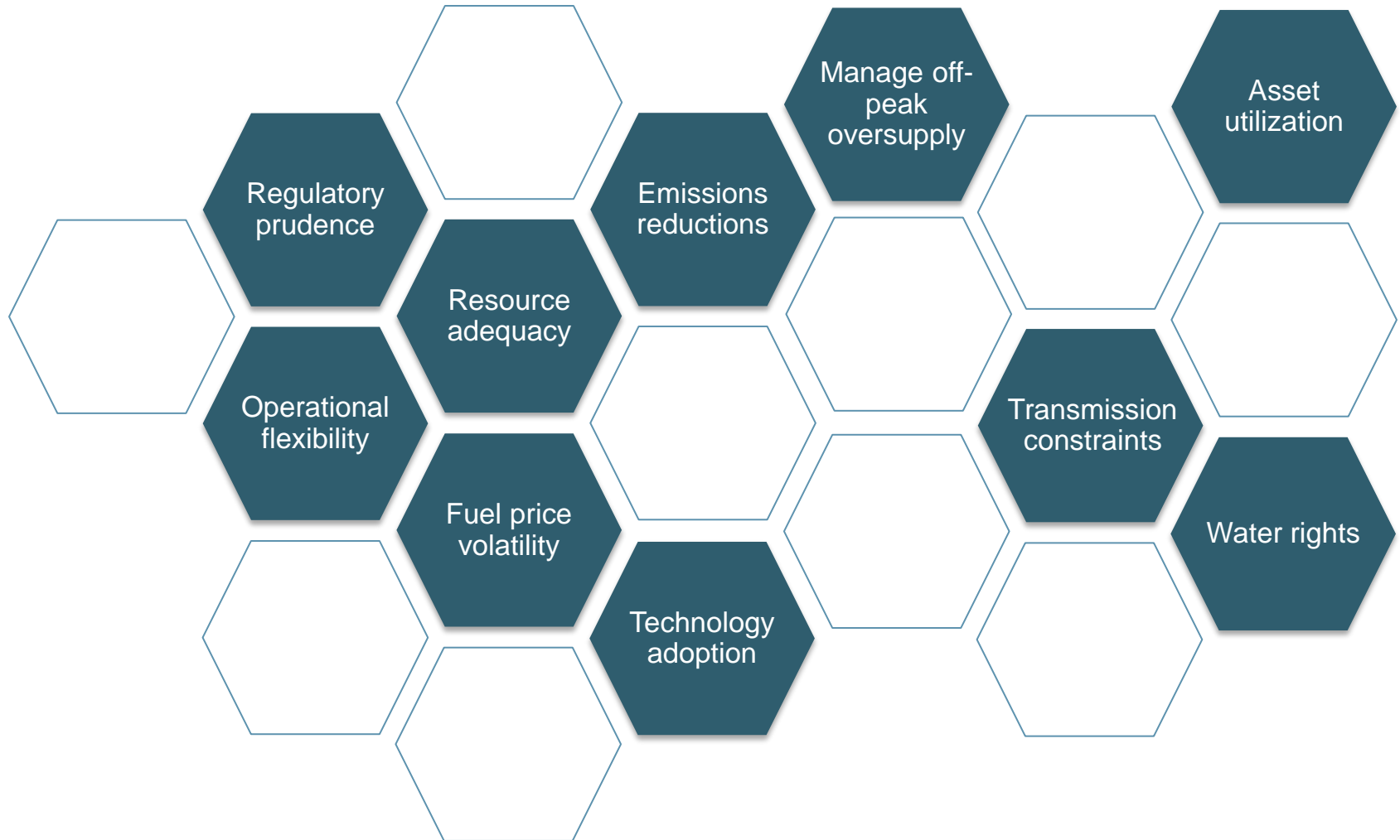
Transmission

Distribution

## AES Utility Customers (U.S.)



# Utilities balance many challenges in making resource decisions.





# AES Energy Storage offers utilities a complete peaking power plant alternative using batteries.



Customer/Industry  
Established Needs:

Efficiently Manage  
System Reliability

Meet Peak Demand &  
Manage Off-peak Over-  
Supply

Current Solutions:  
*"Build more factories."*

Hold Back Economic  
Power Plants

Build Low Capacity  
Factor Plants,  
Curtailed Wind, Hydro



AES ES Offerings:  
*"Build warehouses!"*

Advanced Reserves  
(Chile – "Capacity Release")

Capacity Alternative  
(“Peaker Replacement”)



# Combined-Cycle Gas: Efficient, Untapped Value

## Gas Peakers: Inefficient, Insurance Policies



### 800 MW Combined Cycle Gas

- Efficient (6800 BTU/kWh)
- Among cleanest

<50% utilization\*



### 50 MW Gas Peaker

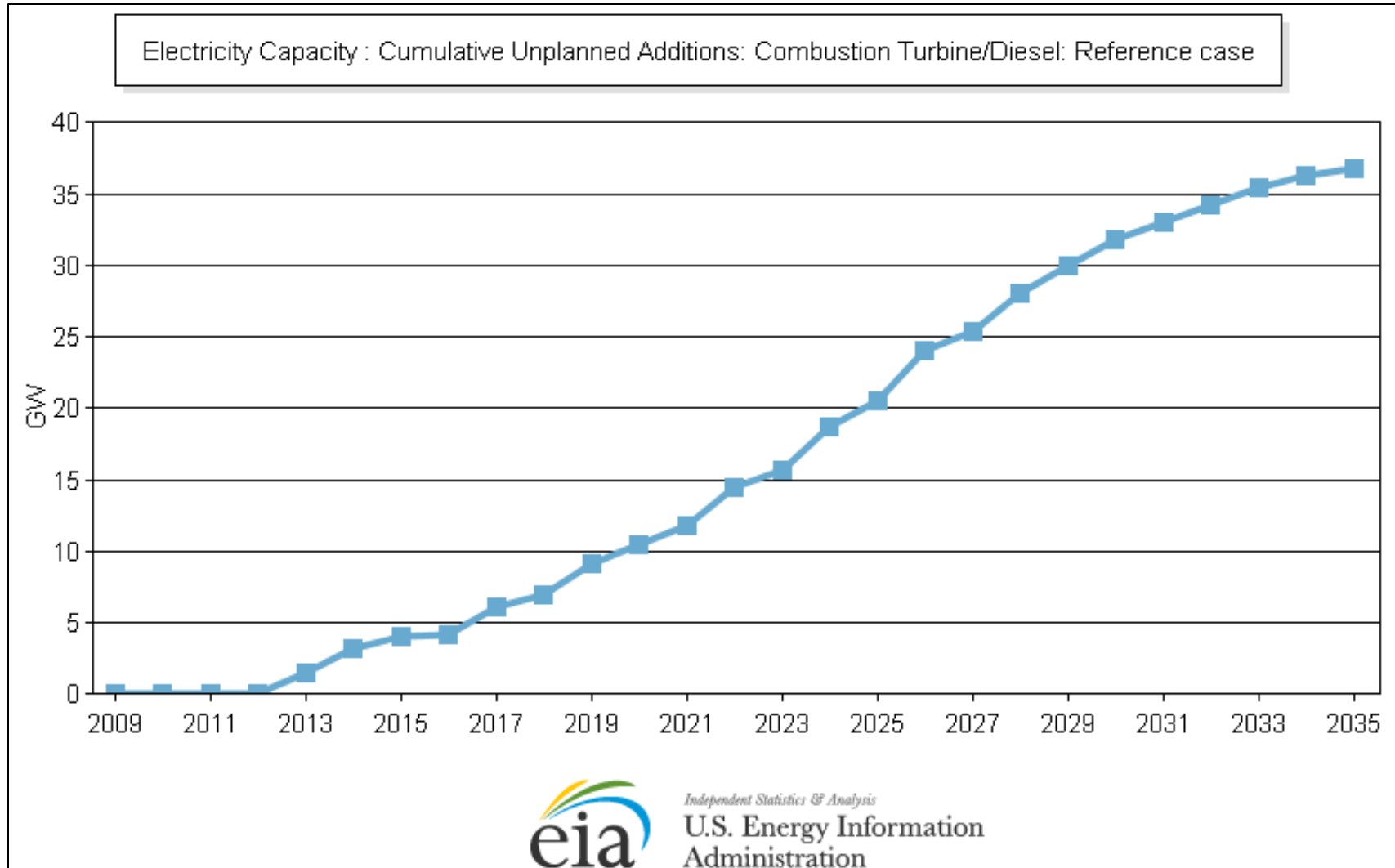
- Inefficient (10500 BTU/kWh)
- Higher emissions

<10% utilization\*

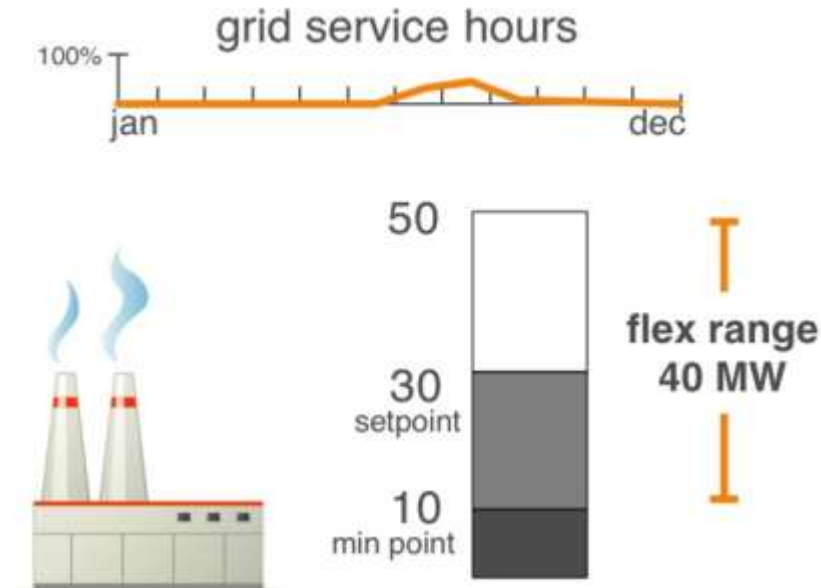
\*U.S. fleet average capacity factors for similar plants, EIA.



# Energy storage can serve resource adequacy needs and improve utilization of existing resources.



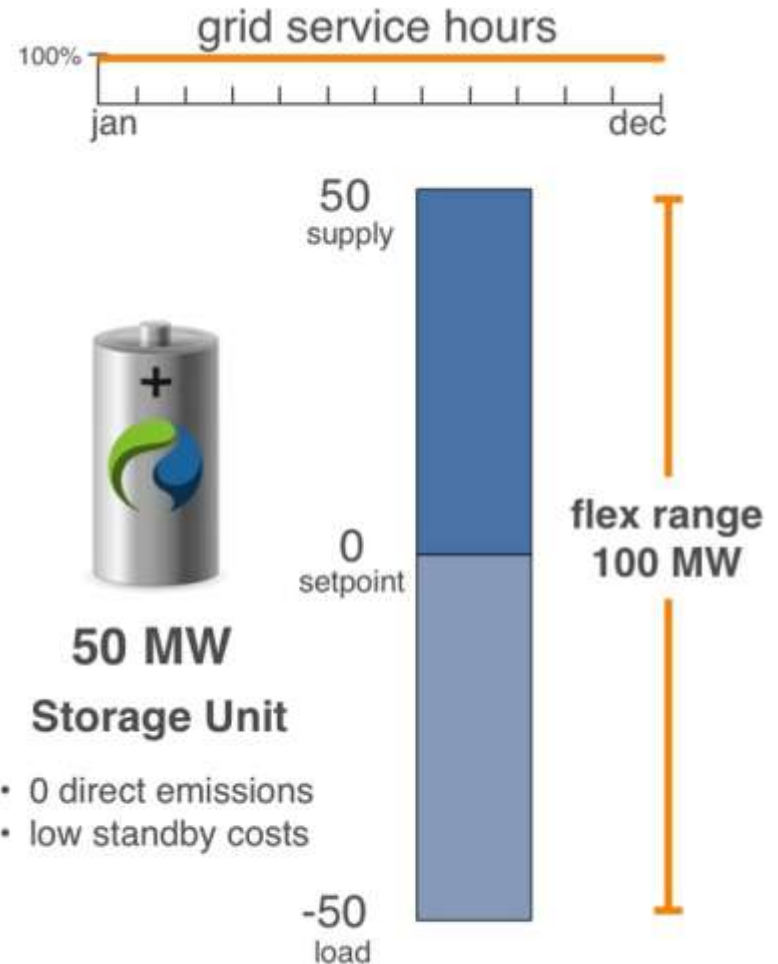
# Energy storage is least cost to meet flexibility requirements – more MW around the clock.



## 50 MW Gas Peaker

- out of merit generation
- significant standby costs
- standby emissions

*minutes to dispatch*



## 50 MW Storage Unit

- 0 direct emissions
- low standby costs

*seconds to dispatch*

# Planning Flexibility: Permitting profile allows for unprecedented siting for a power resource.



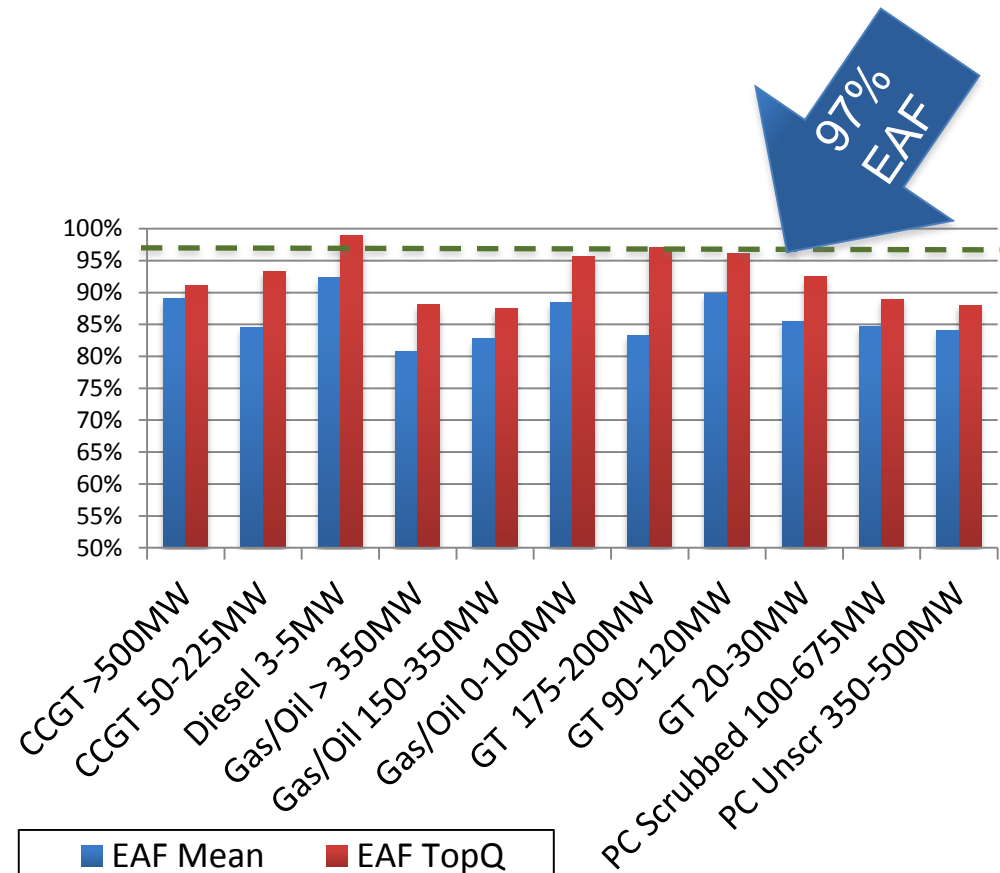
Typical Facility

Site Permitting Profile	Air	Water	Fuel	Site Plan	Stormwater
AES Capacity Alt.	Not Applicable	Not Applicable	Not Applicable	Required	Required
Power Plant	Required	Required	Required	Required	Required

# System Reliability: Modular design drives high availability.

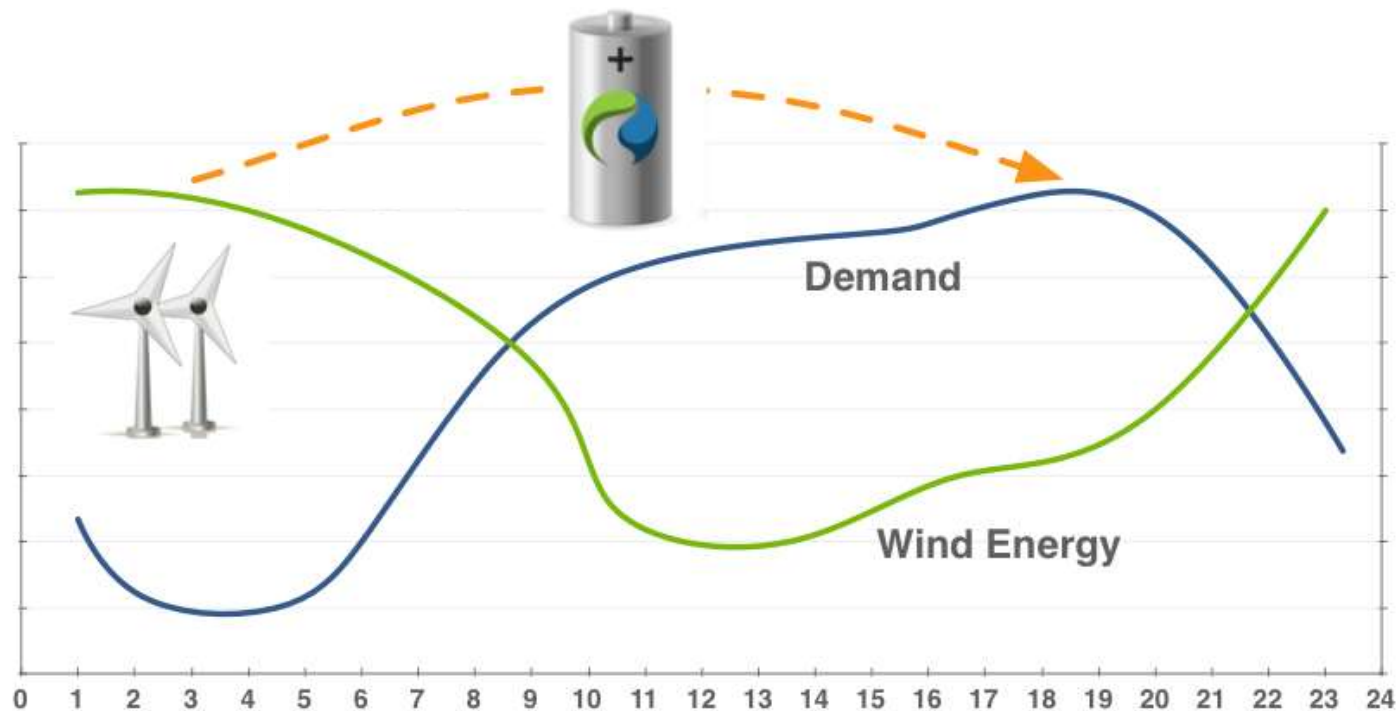


100MW unit with one  
module unavailable



Source: Navigant, AES,

# Energy Efficiency: Select most efficient fuel source, and reduce system emissions.



# More regulatory support is needed...

- Planning: RPS (renewable portfolio standard) programs should consider capacity in addition to energy and plan for coordinated deployment goals.
- Procurement: Regulators should encourage long-term contract structures from markets and utilities for emissions-free, flexible capacity resources.
- Market Updates: Market mechanisms should reward flexibility and precision in “pay-for-performance” models.
- Incentives: Full ITC (investment tax credit) treatment for energy storage to level the playing field with other emissions-free grid resources (such as solar).



# State legislation on energy storage – enacted and proposed.

State	Bill	Description
California	AB 2514 (Skinner) Sep 2010	Required PUC to look at energy storage procurement targets for utilities. <i>Signed by governor Sep 29, 2010. Under CA PUC consideration in Proceeding R1012007.</i>
New York	S.607-B (Maziarz) A.3656-A (Cahill) Mar 2011	Removed a regulatory barrier for energy storage by adding batteries to the definition of “alternate energy production facilities”, thereby reducing PSC administration over construction and financing. <i>Signed by governor Mar 25, 2011.</i>
Texas	SB 943 (Carona) HB 1421 (Anchia) Jun 2011	Allowed energy storage resources to be classified as generation, and thereby owned/operated by a Power Generation Company. <i>Signed by governor Jun 17, 2011. Implemented Nov 10, 2011 by TX PUC under control number 39657.</i>
Washington	HB 2198 (Morris) Jan 2011	Includes energy storage in utility Integrated Resource Planning.

# Reliable & Sustainable, Prudent & Progressive

