

# Energy Storage in Capacity Planning & Resource Adequacy

John Fernandes  
Director, Regulatory Affairs  
Invenergy  
[jfernandes@invenergyllc.com](mailto:jfernandes@invenergyllc.com)

for the



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## Wind

75 projects  
9,829 MW



## Natural Gas

10 projects  
5,519 MW



## Solar

12 projects  
231 MW



## Advanced Energy Storage

6 projects  
94 MW

# Broad Expertise

We develop, own and operate large-scale renewable and other clean energy generation and storage facilities in North America, Latin America, Japan and Europe.

\* As of May 1, 2017; includes projects that are operating, in construction or contracted.  
Renewables include wind, solar and storage.



# Storage Market Evolution

## Balancing & Ancillary Services

- FERC Order 755 & 784
  - Why PJM?
- Solar Integration – PR & HI

## “Capacity”

- CA Resource Adequacy
- “Capacity Performance”

## Reliability & Multiple Services

- Glacier - PSE
- BQDMP - ConEd



*Bellingham Herald - 2016*

# Barriers to Next Wave

## What is “Flexible Capacity”?

- Serving the Peak
- Optimizing the Fleet
  - Ramping
- Incremental & Mobile Installations

## Additional FERC Activity

- RM17-8: Interconnection
  - Grand Ridge Energy Center
  - Supply vs. T&D
- RM16-1 & 16-6: Frequency Response & Reactive Power

## Technology Advancements

- Carts & horses, chickens & eggs





An aerial photograph showing a large white wind turbine under construction in a cleared area surrounded by dense green forest. A red lattice boom crane is positioned to the left of the turbine, with its arm extending towards the top left. Several vehicles, including a white truck and a red car, are parked on a dirt road to the left. The turbine's three blades are spread out, and its central hub is visible. In the background, rolling hills and more wind turbines are visible under a clear sky.

**We are  
Invenergy.**

**Working  
towards a  
clean energy  
future.**

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