

A large, light gray, stylized sun graphic is positioned on the left side of the slide. It consists of a semi-circle at the top with rays extending downwards, and a larger, more complex shape below it that resembles a sunburst or a stylized sun with rays extending outwards. The graphic is semi-transparent and serves as a background element for the title text.

# **Energy Storage: Midcontinent Independent System Operator (MISO) Perspective**

**July 09, 2015**

# Market platform for non-discriminatory participation

MISO market facilitates non-discriminatory market participation regardless of resource type, business model, sector or location

In addition to traditional generation resources, MISO tariff allows new resource types to provide energy and ancillary service

- Demand Response Resource Type I
- Demand Response Resource Type II
- Stored Energy Resource
- External Asynchronous Resource
- Dispatchable intermittent resource

# Projects and studies related to storage

## Introduced Stored Energy Resource (SER): 2010

- Allow short term storage energy resources to provide regulating reserve

## FERC Order 755 – performance based two-part regulating reserve compensation: 2012

- Fair compensation on resources providing faster and better AGC responses

## AGC enhancement on fast ramping resources – create a fast AGC signal to better utilize fast ramping resources:

- Being prioritized under market enhancement roadmap program
- MISO internal study shows that attracting additional 20% regulating resources can result in \$10 million annual production cost savings
- Transmission Planning studies show potential for grid scale storage

# Market clearing prices are not attractive enough

- Storage resources in MISO market
  - Pumped storage
  - 1MW/7MWh testing battery participated as SER
  - 20MW/5MWh grid scale battery: expected in production 2016
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