



*"Energy Storage Breakthroughs"*

**NASEO Annual Meeting – September 11, 2012**



# Silent Power Inc.



- Located in Baxter, Minnesota
- June 2008
  - New focus to utility controlled distributed energy storage
  - Recapitalized by local investors
- Design & manufacture in Minnesota.
- Series B completed July 2012.

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# The Problem



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# The Clean Energy Paradox....



Solar PV  
Peaks at noon...

- Utilities most basic function is to match electrical supply and demand.
- Renewable Energy Is Great For The Environment
- Renewable Energy is Great For National Security

## However.....

- Dilemma - Renewable energy complicates this.
- Renewable Energy Makes the Grid Less Reliable
  - Grid demand peaks between 4pm and 7pm
  - Excess Solar PV creates voltage and frequency issues

Wind Generation  
occurs mostly  
at night...



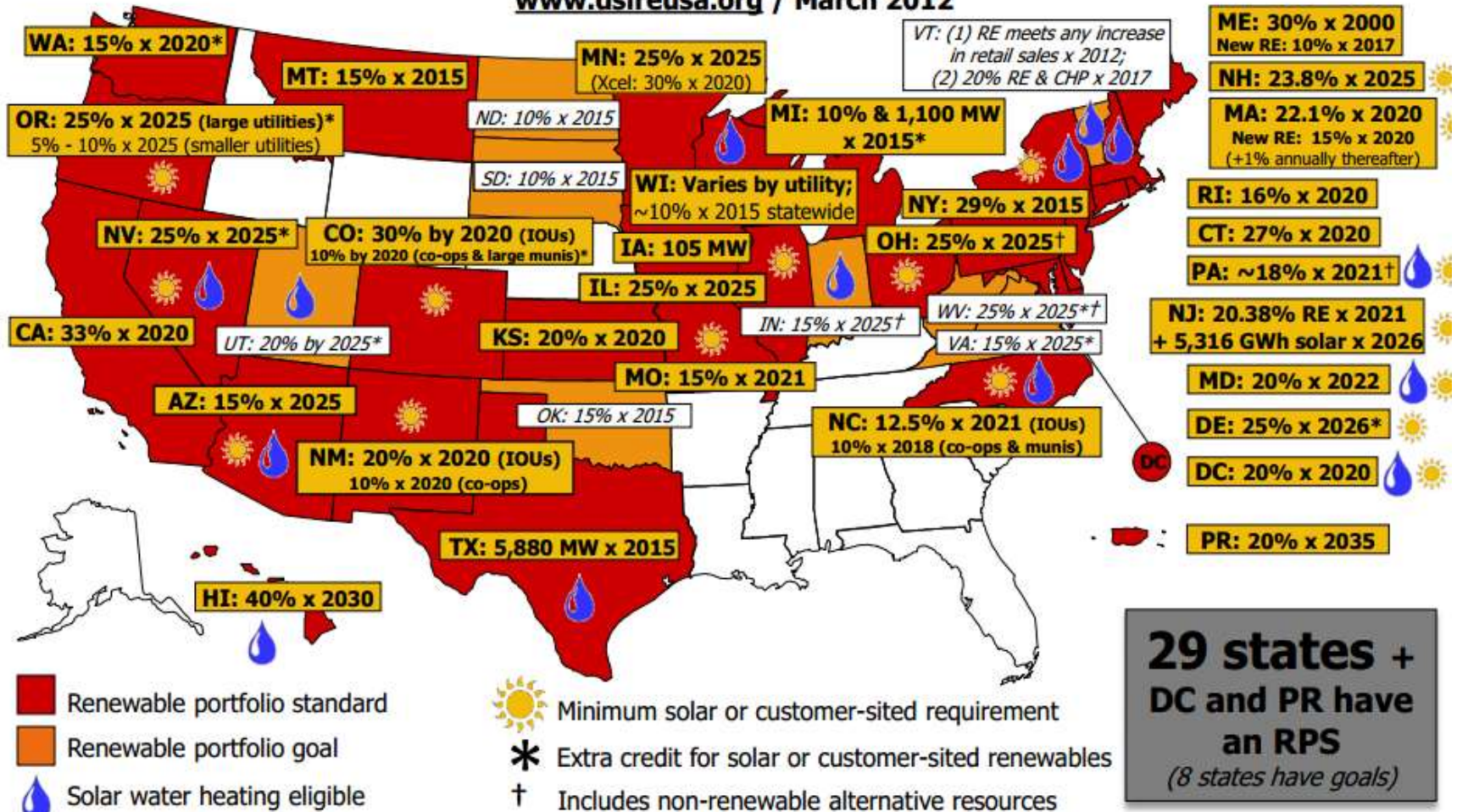
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# States with Legally mandated RPS Requirements

## RPS Policies

[www.dsireusa.org](http://www.dsireusa.org) / March 2012



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# OnDemand Energy Appliance



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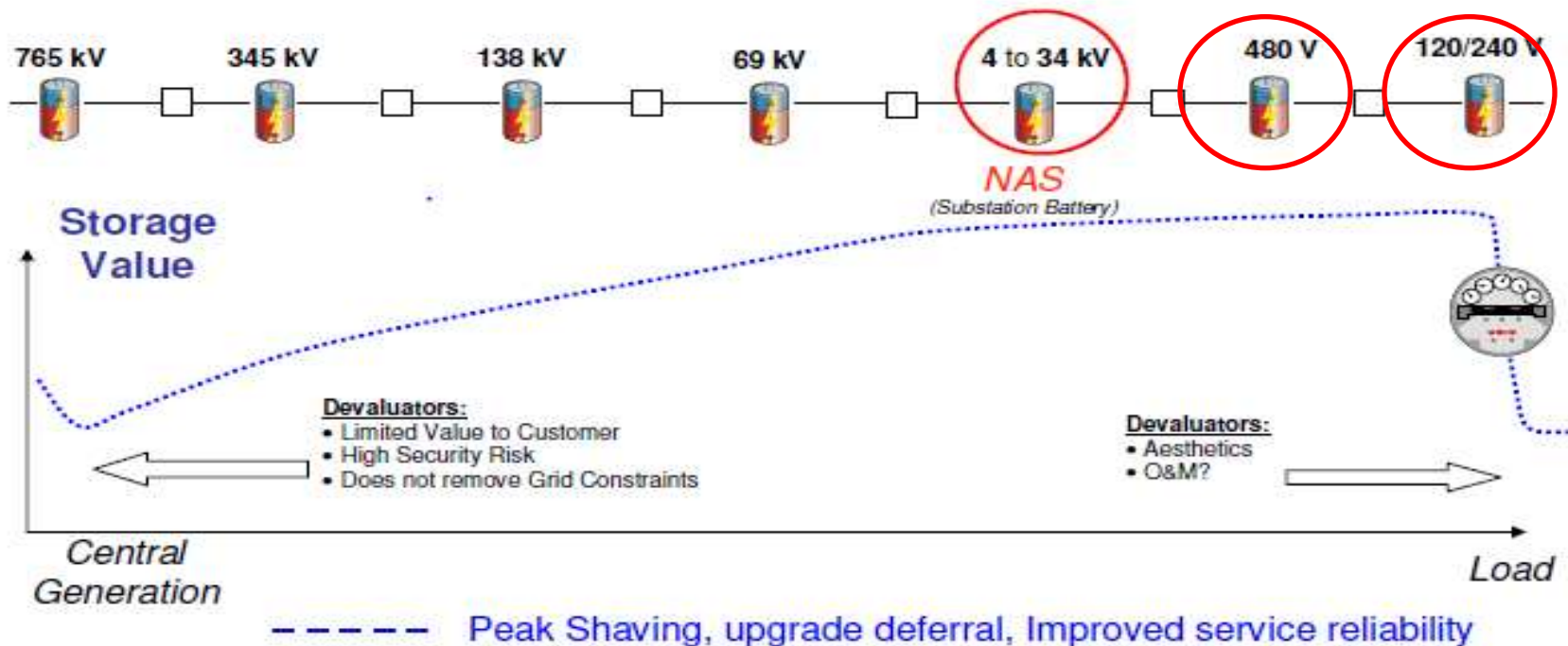
# OnDemand Energy Appliance



- Installed behind the meter
- Can be Utility controlled
- Dispatch energy at peak demand periods
- Battery technology
  - AGM-VRLA (sealed lead acid)
  - Lithium Ion
    - Cost driven by electrical vehicle volume.
    - SPI- First in the world to receive UL listing with this technology & Lithium Ion.

# Distributed Storage Value Curve

## Value Associated with Storage Locations on the Grid



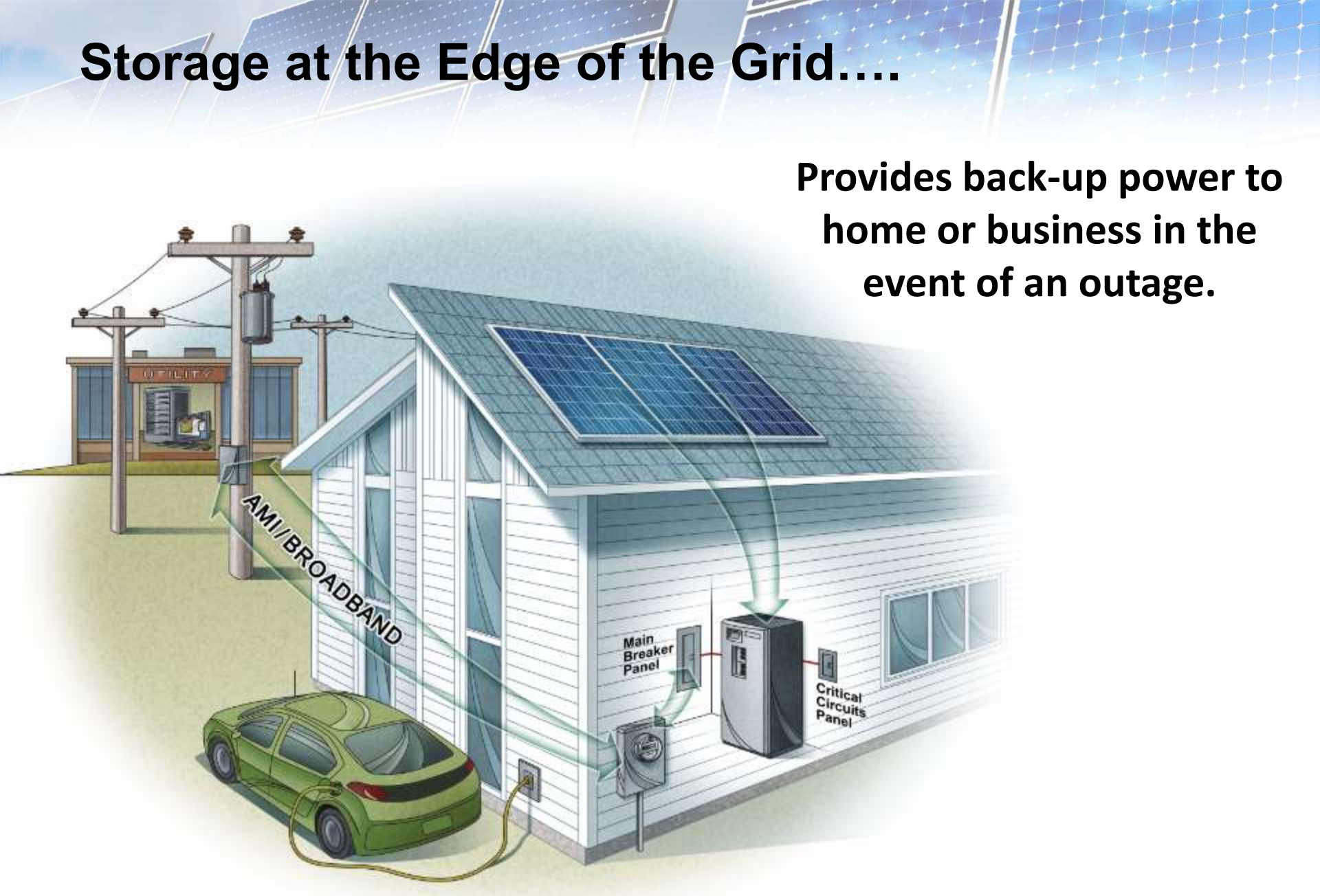
Distribution circuits appear to offer most value for hosting storage

16



# Storage at the Edge of the Grid....

**Provides back-up power to home or business in the event of an outage.**



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# Minnesota Collaboration



# Emerging Renewable Energy Industries Grant Program



- Awarded 2011
- GOAL: Improve or expand an existing Minnesota manufacturing activity.
- Added to facility, production, & employees
- 6 positions currently open
- Expanding 7500 sq. ft. in 2013
- Helped SPI bridge the gap to our Series B.



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# Minnesota Conservation Improvement Program (CIP)



division of  
**energy**  
resources  
Minnesota Department of Commerce

- Every Minnesota utility required to spend 1.5% of their annual revenues towards energy conservation technologies.
- 50% of this spending can go towards customer load management
  - AC cycling
  - Off-peak water heaters
- Silent Power/Utilities have worked to add utility controlled, customer sited energy storage as eligible load management technology
- Many states have similar programs
  - Minnesota to serve as model

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# Other Options for Distributed Energy Storage

## Modification of Existing Demand Response Programs

- Lower kW eligibility for programs
- Allow aggregation of smaller kW assets to meet program kW thresholds
- Tailor dispatch requirements to 2 hours

## Utility Ownership of behind-the-meter Energy Storage

- Allows utilities to place energy storage where it creates the most value

## State Energy Storage Rebate Programs

- See California Self Generation Program (\$2/watt rebate)

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# Thank You

