

# **Pondering the Big Questions in the Electric Industry**

**Martin Lowery  
Executive Vice President, External Affairs  
NRECA**

**January 19, 2012**



# The Questions

- What will happen to coal-based generation?
- Is a smarter grid worth the effort?
- Is storage a game changer for renewable energy?
- Are electric cooperatives the future of the industry?

What will happen to coal-based generation?

# Coal in the 21<sup>st</sup> Century

- Cap-and-trade will not likely return
- CO<sup>2</sup> will continue to be a public policy issue
- Multi-pollutant target reductions will increase
- Natural gas will likely remain strongly competitive
- China and India will continue to be major coal consumers

# The Strategy

- Accept the on-going need for baseload generation
- Continue to invest in multi-pollutant control technologies
- Invest in research on the beneficial uses of carbon
- Adopt a “multiple fuel” portfolio approach
- Treat energy efficiency as a fuel source

# Current CRN Work on Multi-Pollutant Control Technology

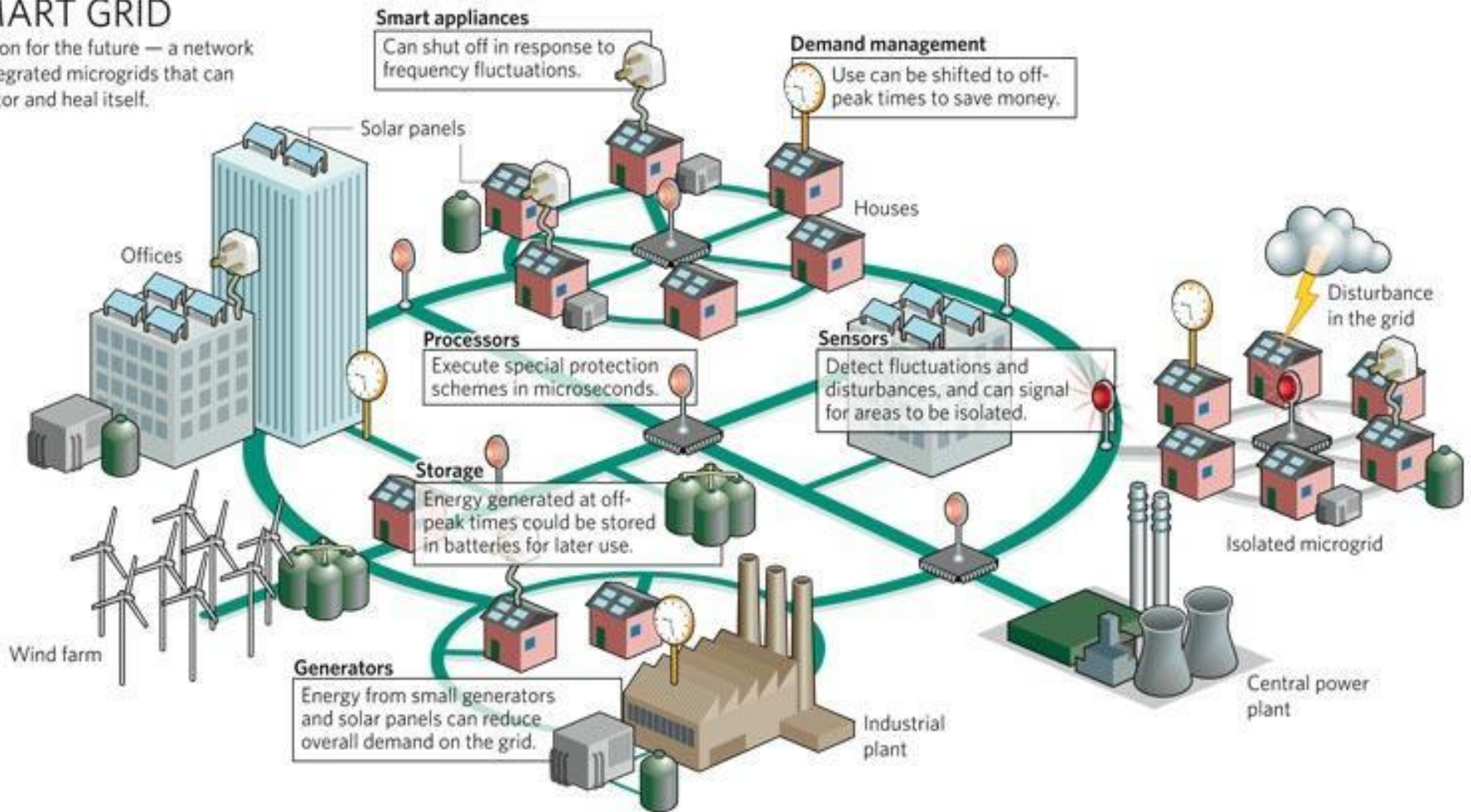
- Removal of Acid Gases - Sulfur Trioxide, Hydrochloric Acid, and Others -- Greater than 90%
- Removal of Mercury and other Heavy Metals -- Greater than 90%
- Reduction of NO<sub>x</sub> -- 40% to 60% depending on the type of coal and boiler

Is a smarter grid worth the effort?

# The Dream

## SMART GRID

A vision for the future — a network of integrated microgrids that can monitor and heal itself.



# A Smarter Grid Demonstration

- \$68 million cost-shared contract with DOE
- 23 participating electric cooperatives
  - In-home displays and web portals
  - Demand response over AMI
  - Prepaid metering
  - Smart feeder switching
  - Advanced volt/var control
  - Renewable integration
  - Conservation voltage reduction

# CRN Smart Grid Demonstration

## Participating Cooperatives

### Region I/IV

Blue Ridge EMC (NC)  
Delaware County Electric Cooperative (NY)  
Energy United (NC)

### Region II/III

Flint Energies (GA)  
Owen Electric Cooperative (KY)  
Salt River Electric Cooperative (KY)  
Snapping Shoals EMC (GA)

### Region VII/IX

Delta-Montrose Electric Association (CO)  
Kauai Island Utility Cooperative (HI)  
Kotzebue Electric Association (AK)

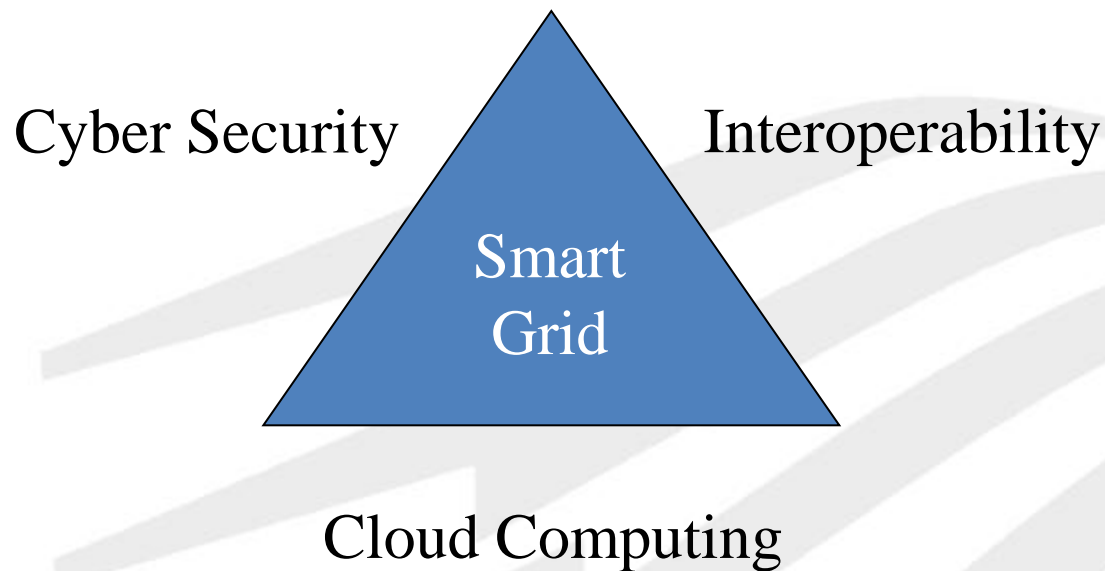
### Region V/VI

Adams Electric Cooperative (IL)  
Adams-Columbia Electric Cooperative (WI)  
Calhoun County Electric Cooperative (IA)  
Clarke Electric Cooperative (IA)  
Corn Belt Power Cooperative (IA)  
Great River Energy (MN)  
Humboldt County REC (IA)  
Iowa Lakes Electric Cooperative (IA)  
Lake Region Electric Cooperative (MN)  
Menard Electric Cooperative (IL)  
Minnesota Valley Electric Cooperative (MN)  
Prairie Energy Cooperative (IA)

### Region VIII/X

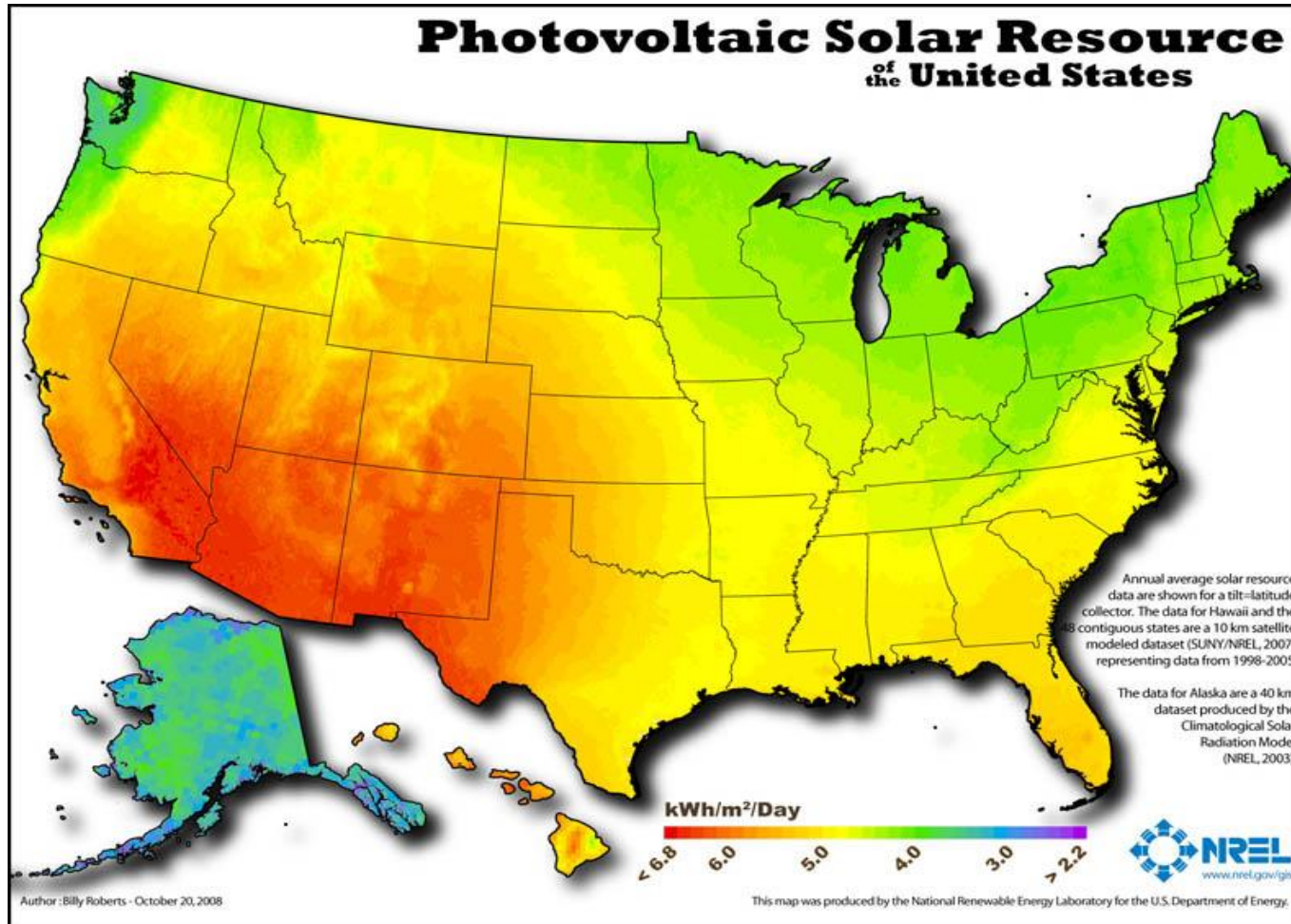
Washington-St Tammany Electric Coop. (LA)

# Focus of Additional CRN Research



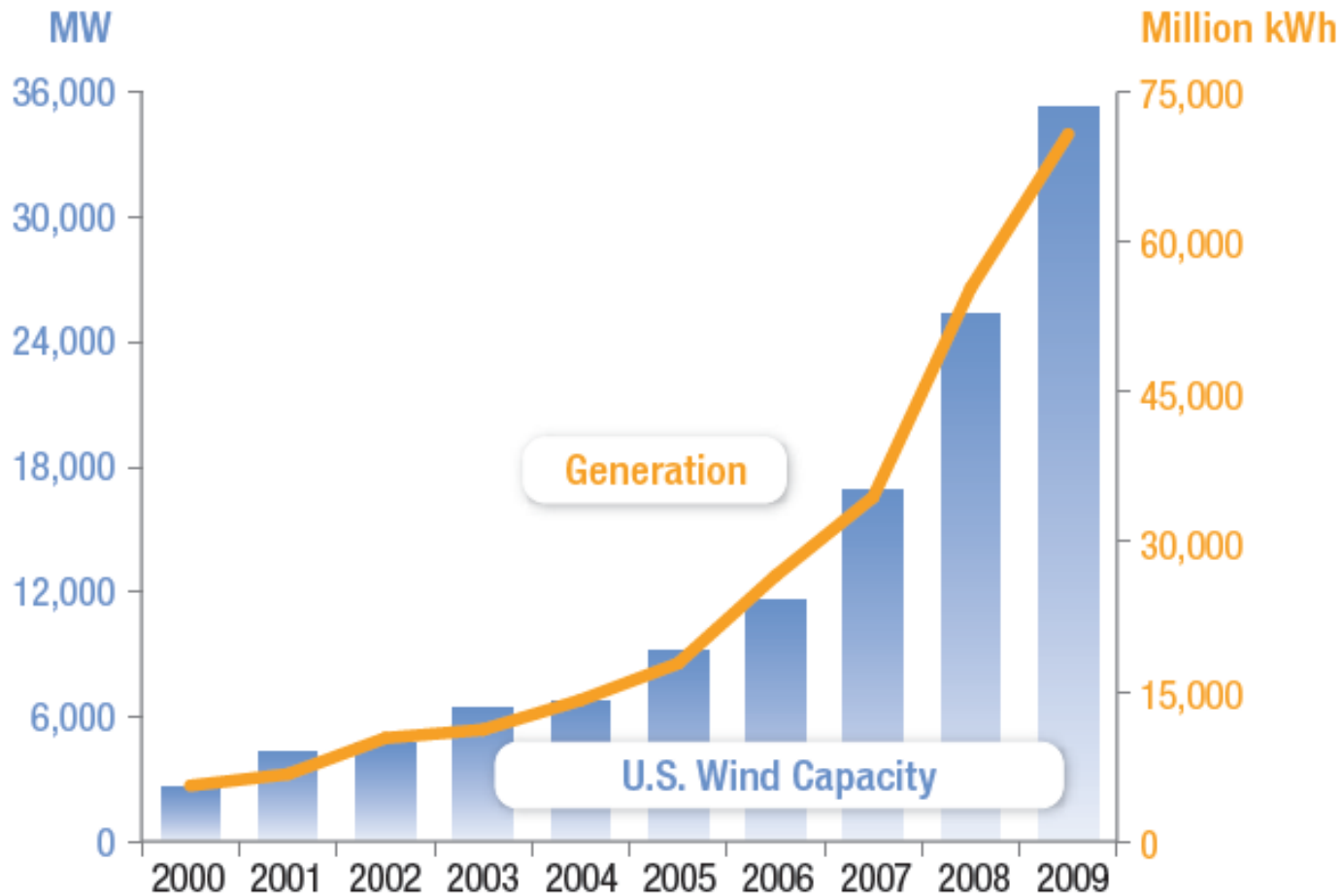
Is storage a game changer for  
renewable energy?

# U.S. Solar Capacity

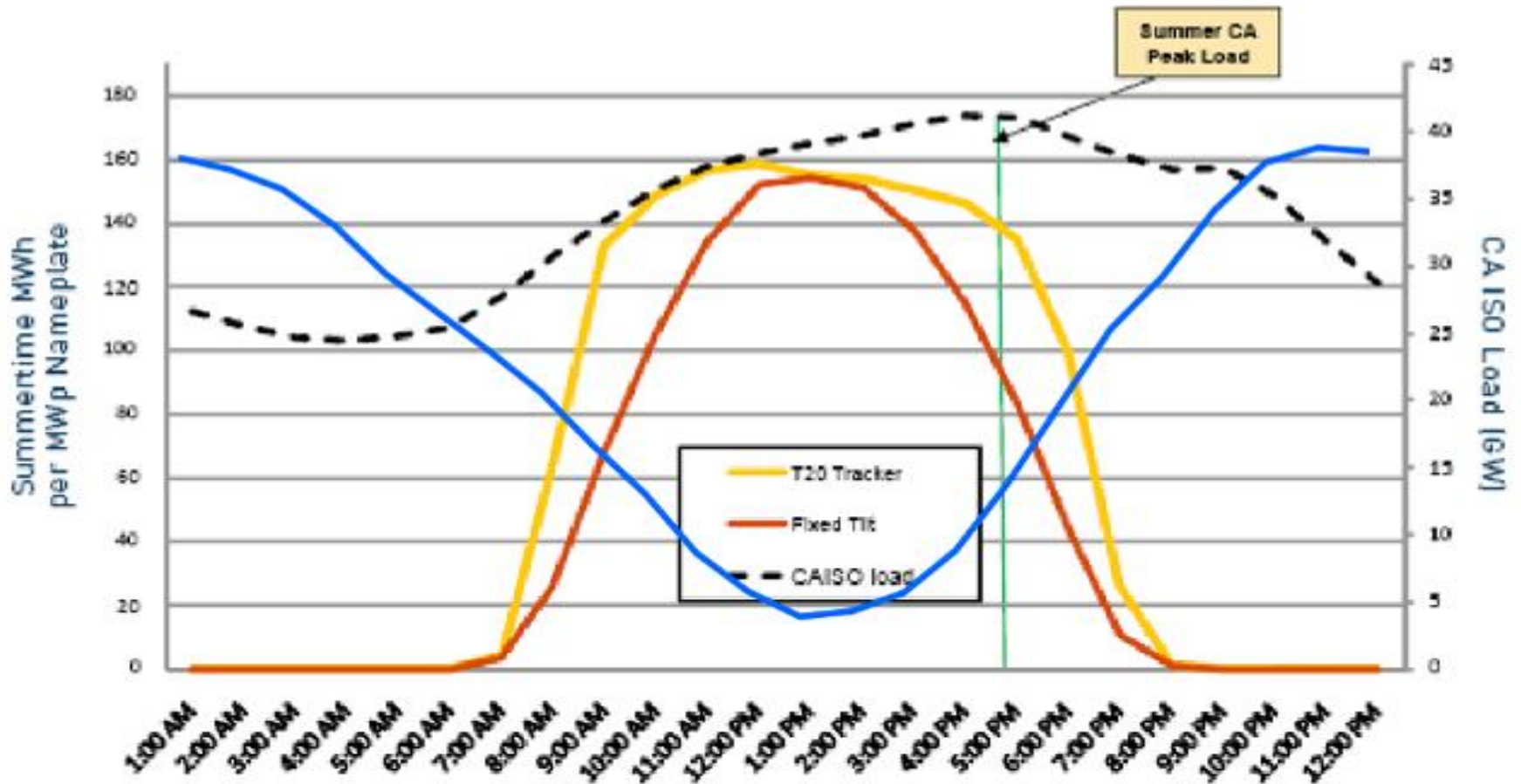


Source: NREL

# U.S. Wind Capacity and Energy



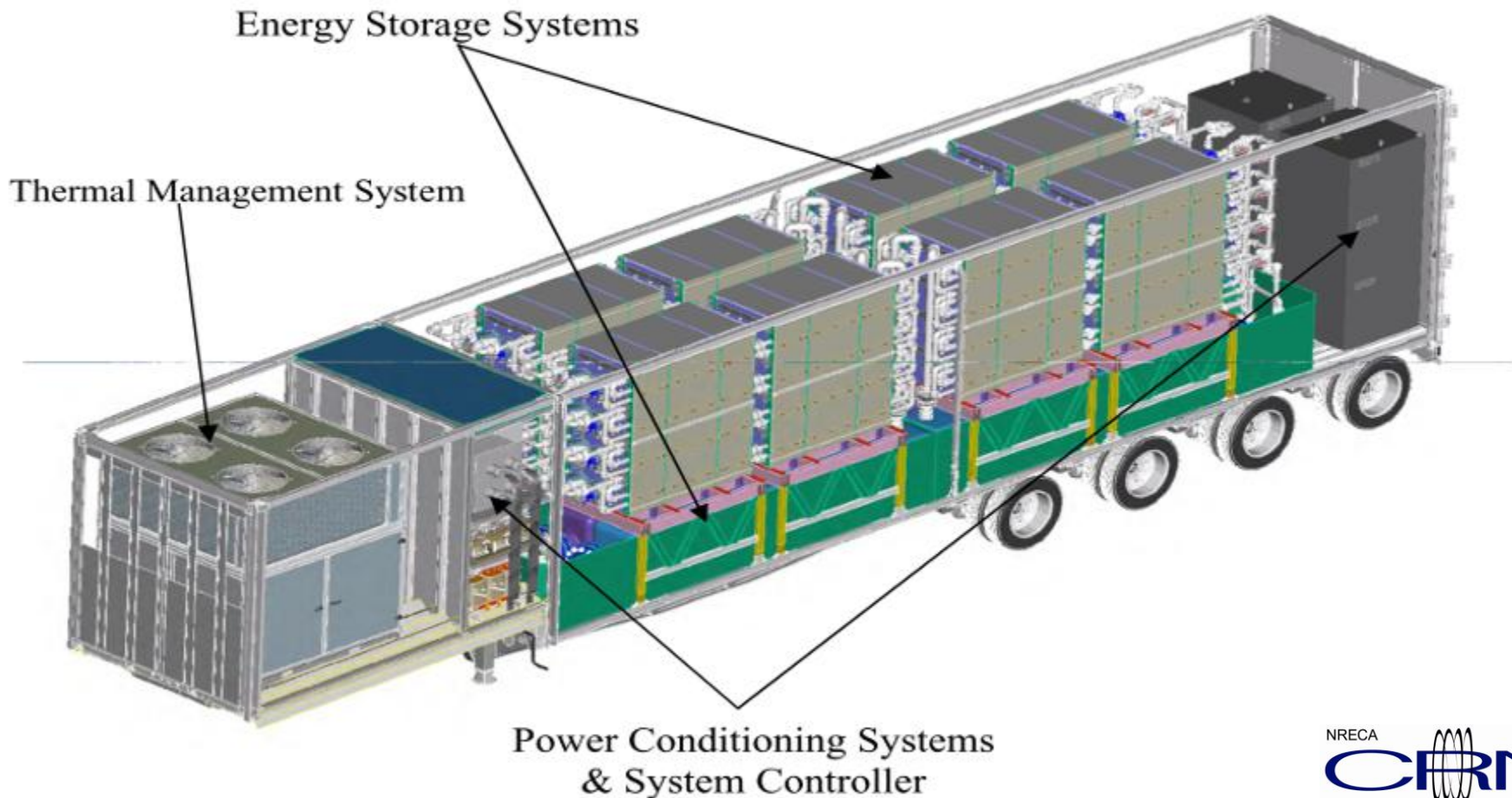
# Wind, Solar and Hourly Loads



Source: solar chart from SunPower; wind curve from CEC

# Premium Power Corporation ZnBr Battery

500 kW @ 7.4 hours = 3.7 MW-hr



# Looking Ahead.....

- Cyber Security
- Coal Ash Residuals
- Distribution Fault Anticipation
- Super-hydrophobic Technologies
- Expected Life of Energy Efficiency Improvements

Are electric cooperatives the  
future of the industry?

# We are leaders in...

- Cyber security
- Smart Grid interoperability standards (MultiSpeak)
- Demand-side management
- Multi-pollutant control technology
- Energy efficiency
- Member services best practices

# 2012

## The International Year of Cooperatives

- “Cooperative Enterprises Build a Better World”
- “Electric Cooperatives Build a Better World”
- [www.2012.coop](http://www.2012.coop)
- [www.usa2012.coop](http://www.usa2012.coop)
- [www.cooperative.com](http://www.cooperative.com)