Closing Remarks

Jian Sun
Wind Turbines

• Blade Manufacturing
  – Active Flow Control
  – Advanced Composite Materials and Processing

• Wind Farm Design Tools; CFD
  – Modeling and Simulation
  – Interaction Among Turbines and Their Effects on Turbine Design
  – System Optimization

• Advanced Monitoring & Diagnosis Tools
  – Long-Term Reliability
Power Conversion & Grid

- Short-Duration (Seconds to Minutes) Storage is Most Critical
- System Optimization
- PM Machines + Full Power Conversion is the Trend
- Distributed Energy Storage
- System Operation and Control
- New Battery Technologies
Economics & Policy

• Project Performance Lagging Expectations
  – Capacitor Factor Lags Expectation by 20%
  – Capacitor Factor Differs Across Regions by 20%
• Operation Practices May not be Optimal
• Continuous Performance Improvement Necessary
• Small Wind Test Center
• Offshore Wind Lacks Policy and Infrastructure Support; Permitting
• Siting and Performance, Tools
Next Step

- Presentations will be Posted Online
- Continue Dialog and Interactions
- Individual Follow-Up Meetings and Discussion
Comments & Suggestions?
Center for Future Energy Systems

CFES is Here to Facilitate and Support