



Welcome to EPRI-PJM Storage Summit

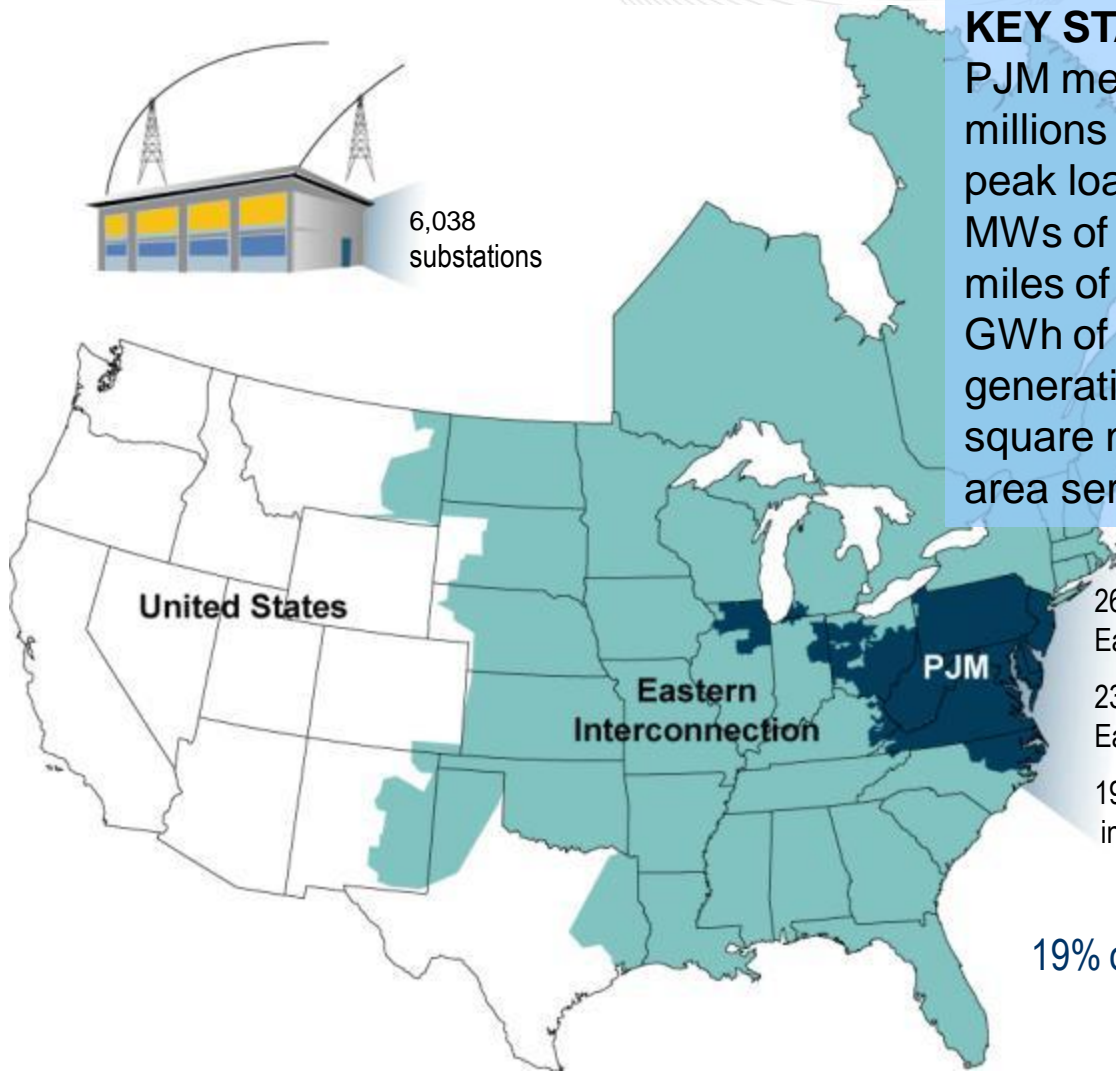
Terry Boston
President & CEO
PJM Interconnection
April 20, 2010



6,038
substations

KEY STATISTICS

PJM member companies	600
millions of people served	51
peak load in megawatts	144,644
MW of generating capacity	164,895
miles of transmission lines	56,499
GWh of annual energy generation sources	729,000
square miles of territory	168,500
area served	13 states + DC

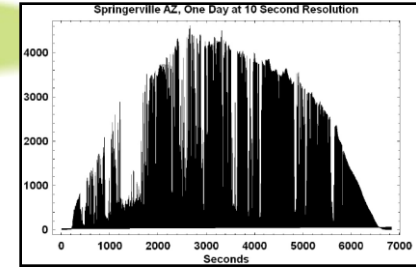
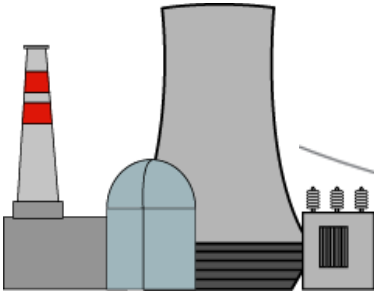


26% of generation in Eastern Interconnection

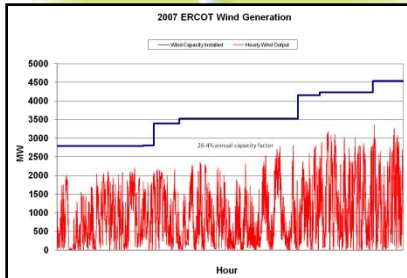
23% of load in Eastern Interconnection

19% of transmission assets in Eastern Interconnection

19% of U.S. GDP produced in PJM



- If you like wind...
- If you like solar...
- If you like nuclear ...

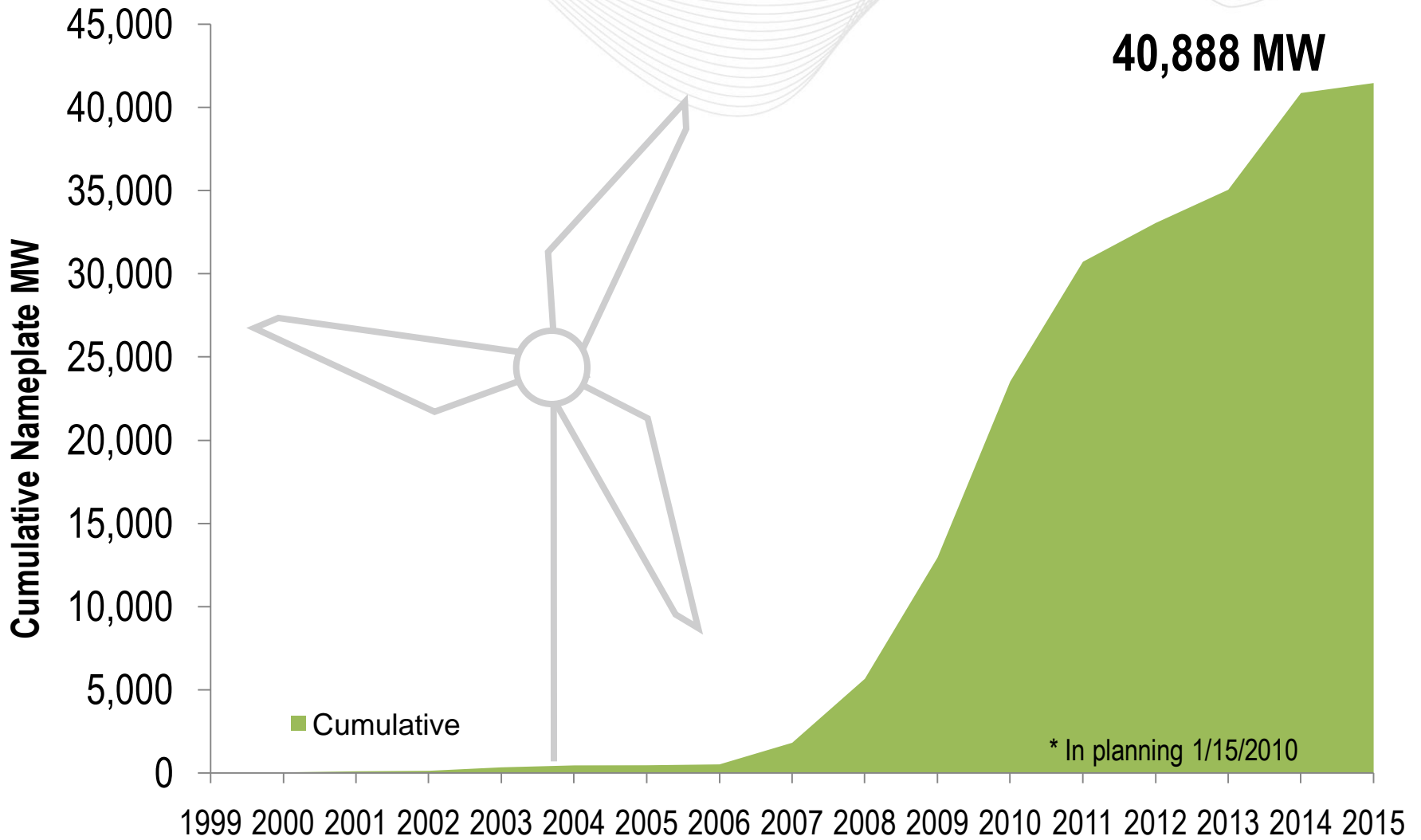


You have to love Storage

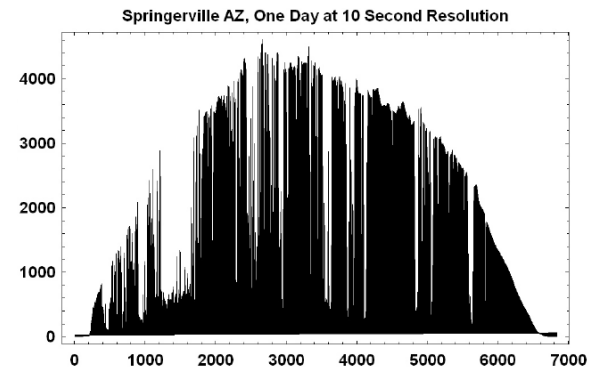
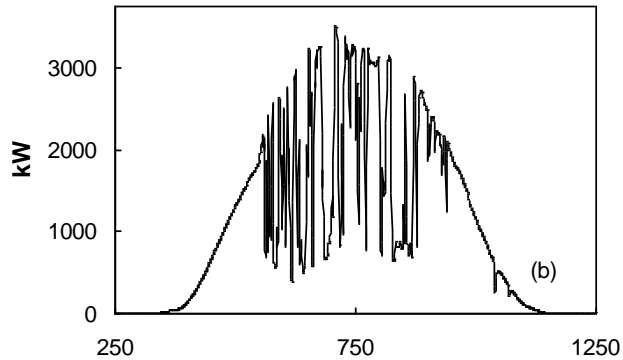
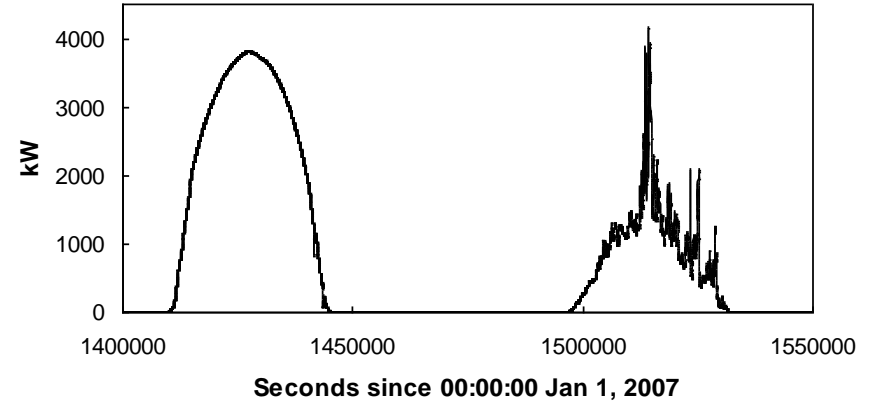
- Storage, Storage and More Storage
- Controllability(PARs, FACTS and HVDC)
- Robust — More
Wire in the Air
- Intelligent
Systems



Wind Generation in PJM - Operational and Proposed

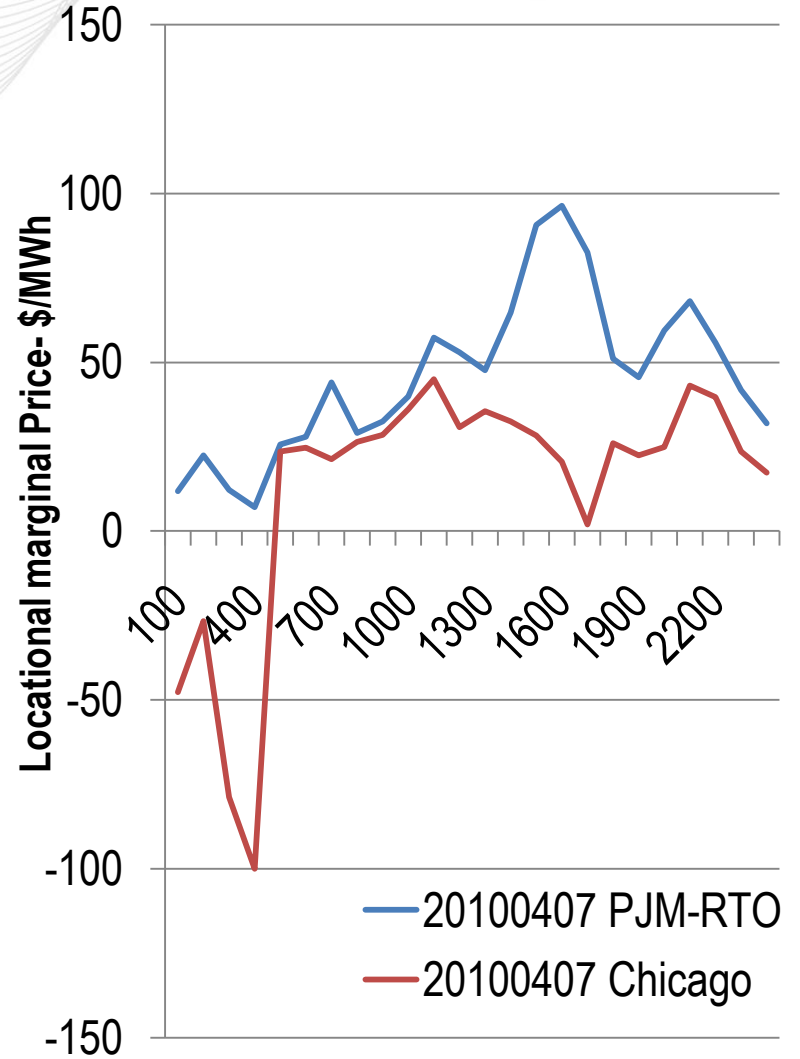
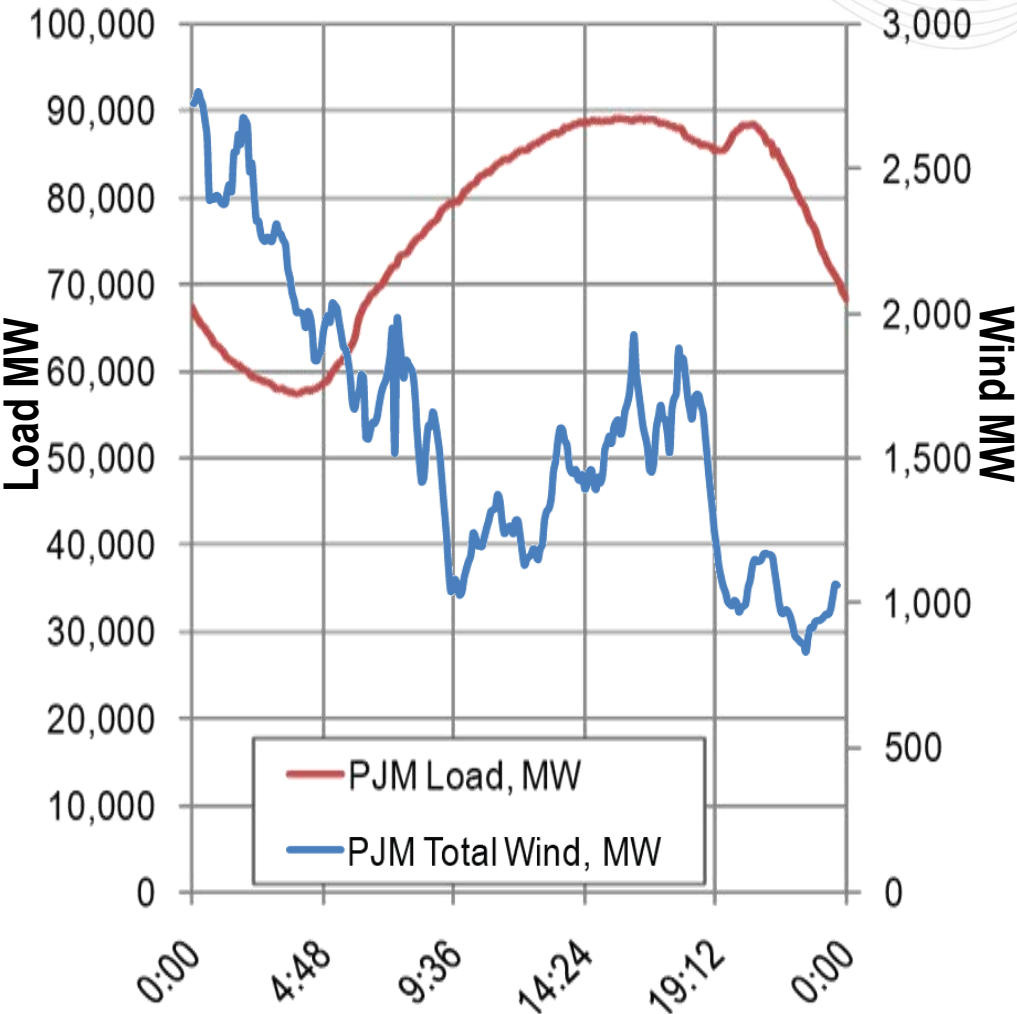


Comparison of Wind with Solar PV 4.6 MW TEP Solar Array (Arizona)

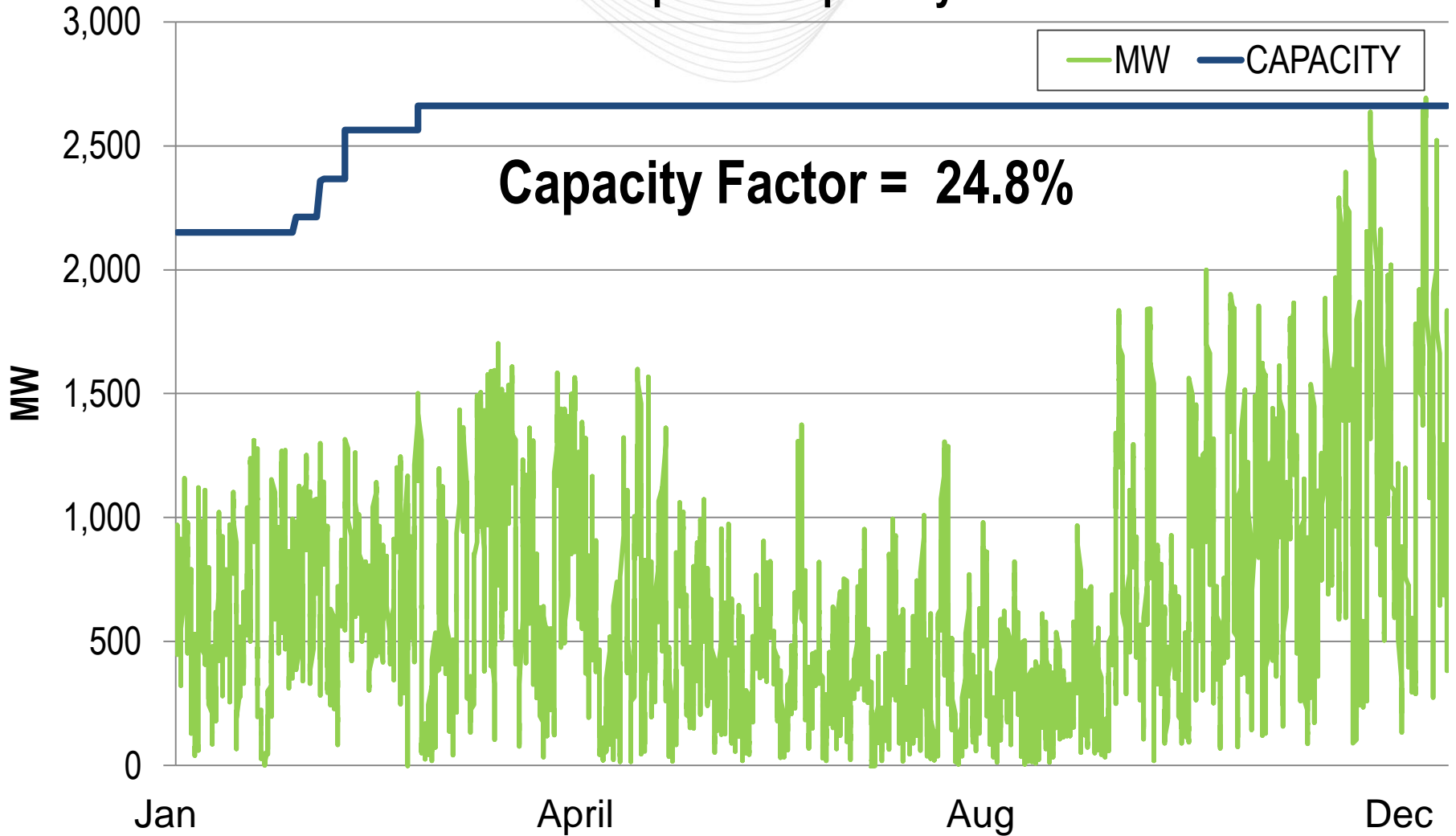


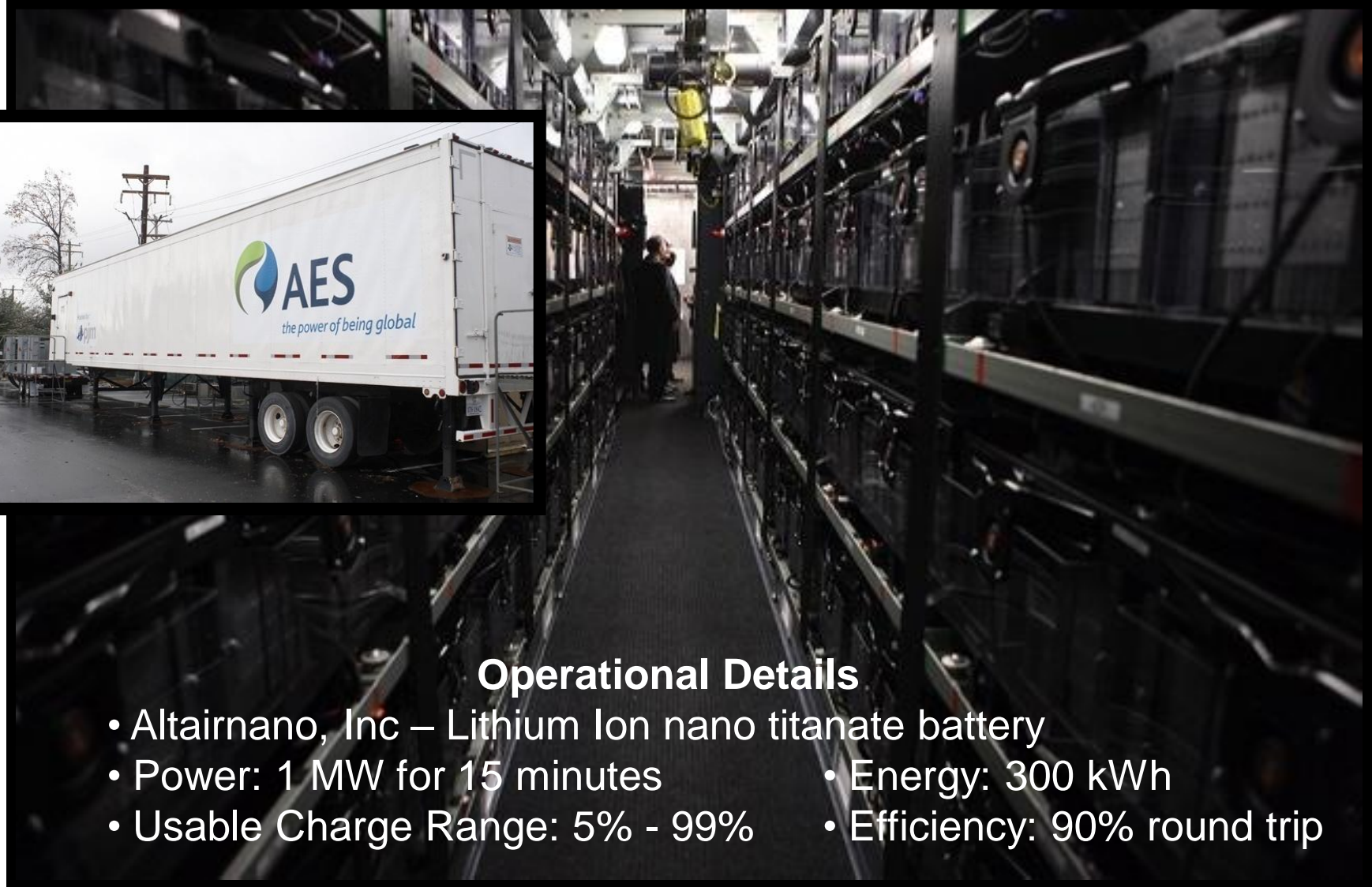
Source: Carnegie Mellon University

PJM Load and Total Wind



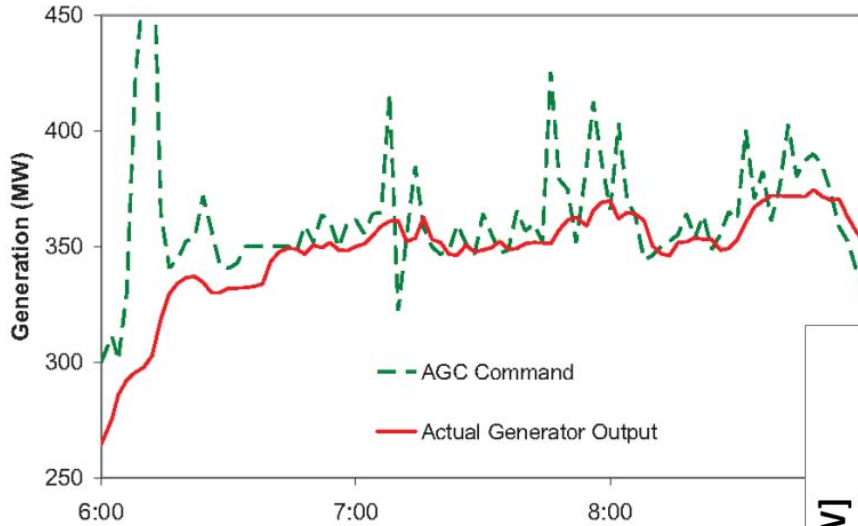
PJM Wind Output vs Capability 2009





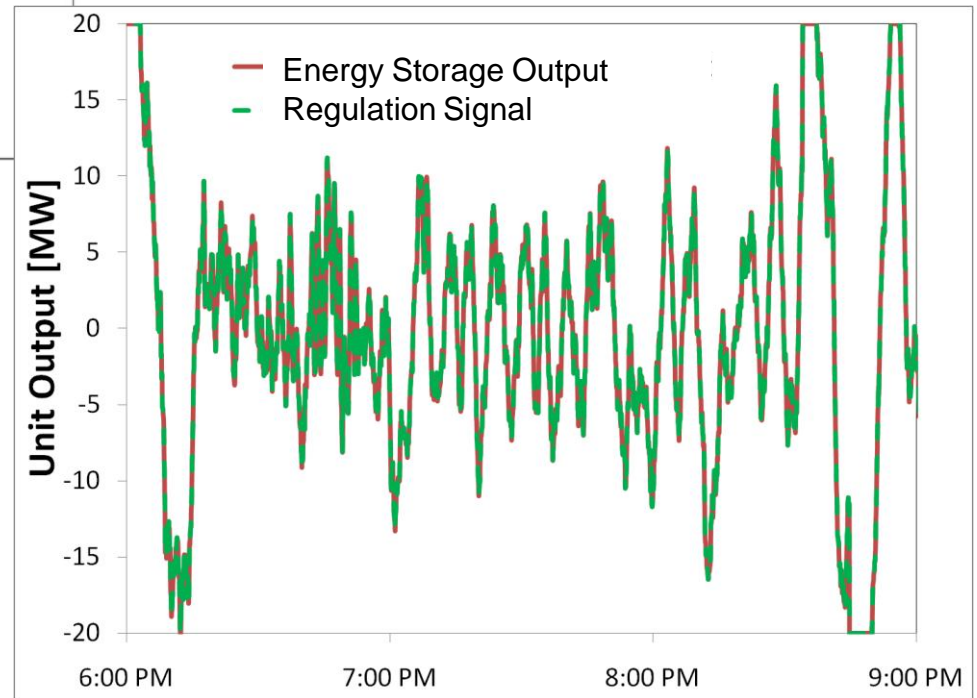
Operational Details

- Altairnano, Inc – Lithium Ion nano titanate battery
- Power: 1 MW for 15 minutes
- Usable Charge Range: 5% - 99%
- Energy: 300 kWh
- Efficiency: 90% round trip

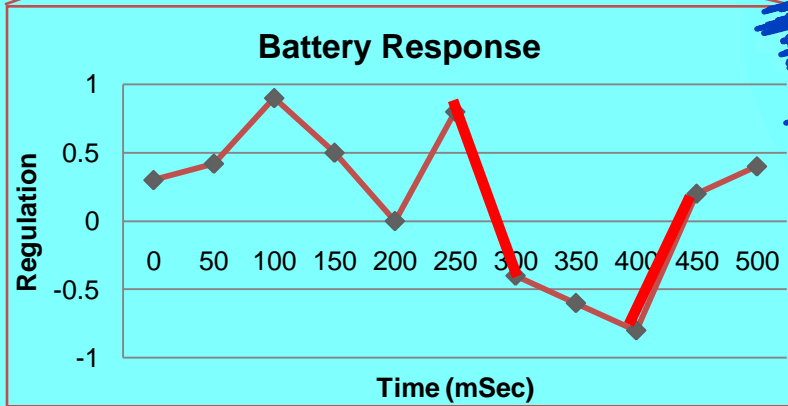
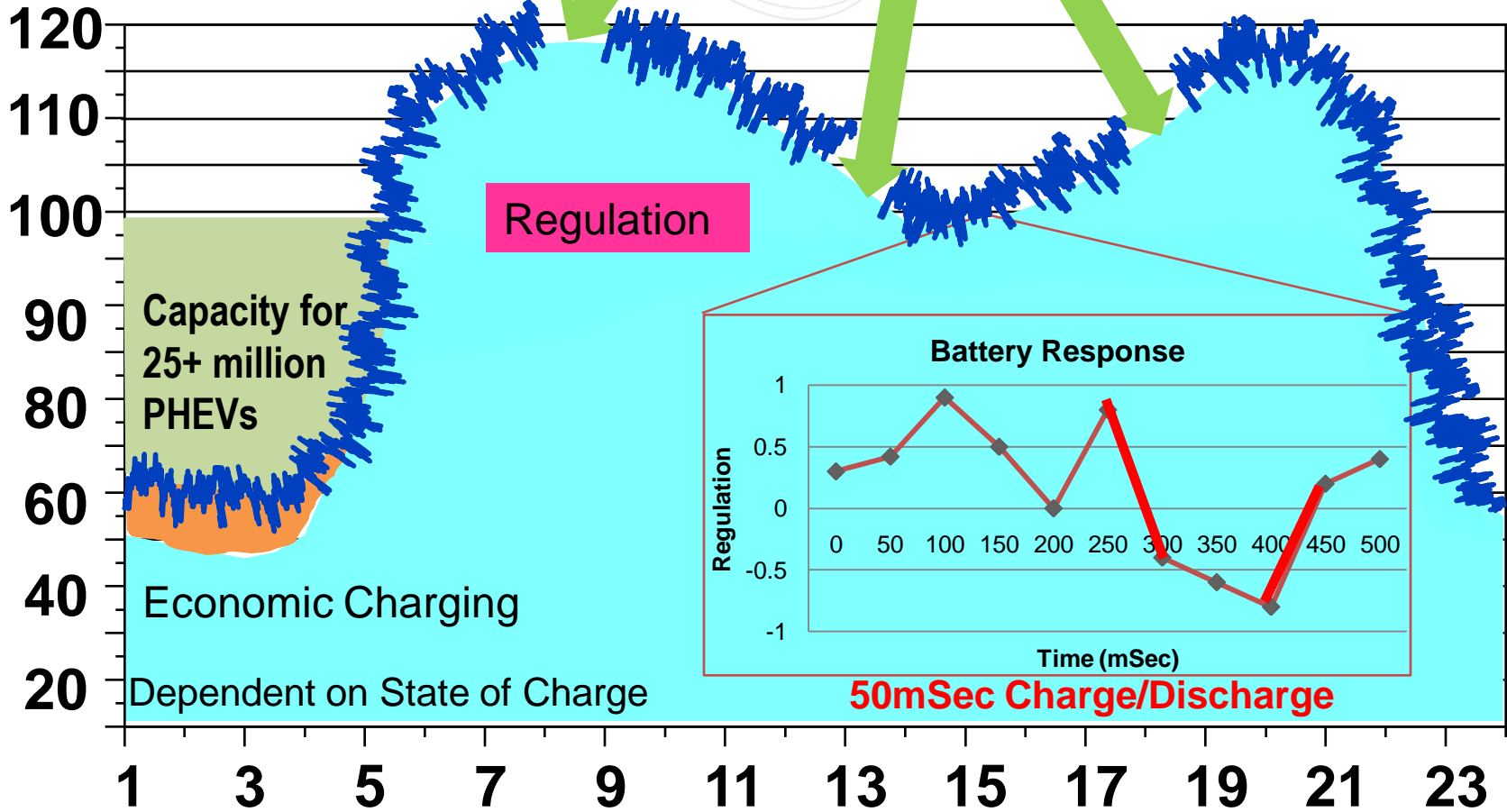


A fossil power plant following a regulation command signal

Energy Storage (batteries / flywheels) accurately following a regulation command signal



Load in GW



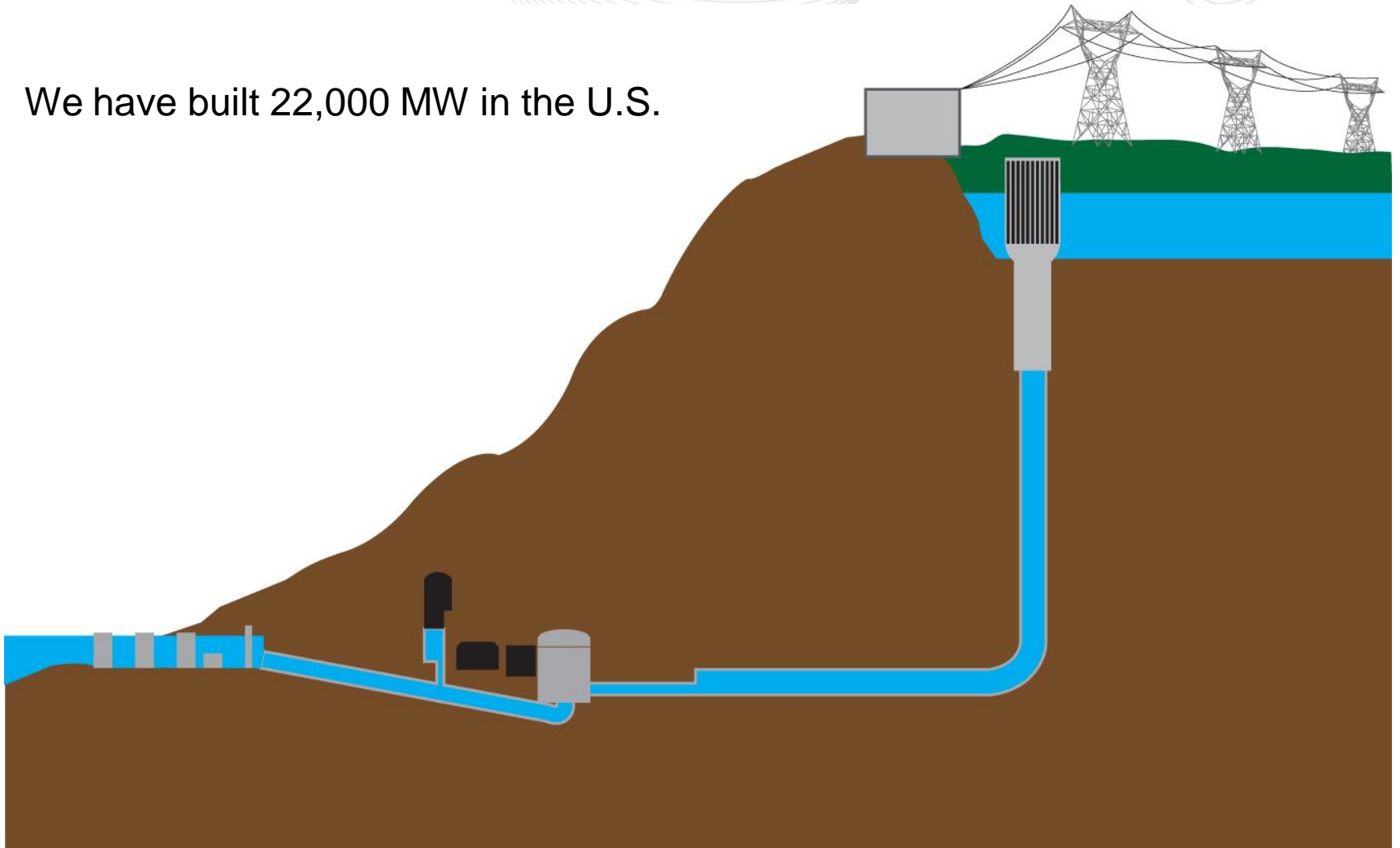
50mSec Charge/Discharge

Hour of Day

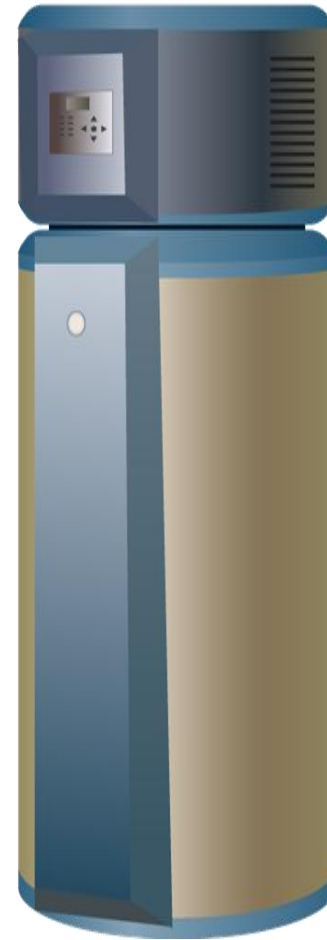
- Smart Metering enables smart cars
- Mid-Atlantic Grid Interactive Car Consortium (MAGICC)
- **Over two years experience**



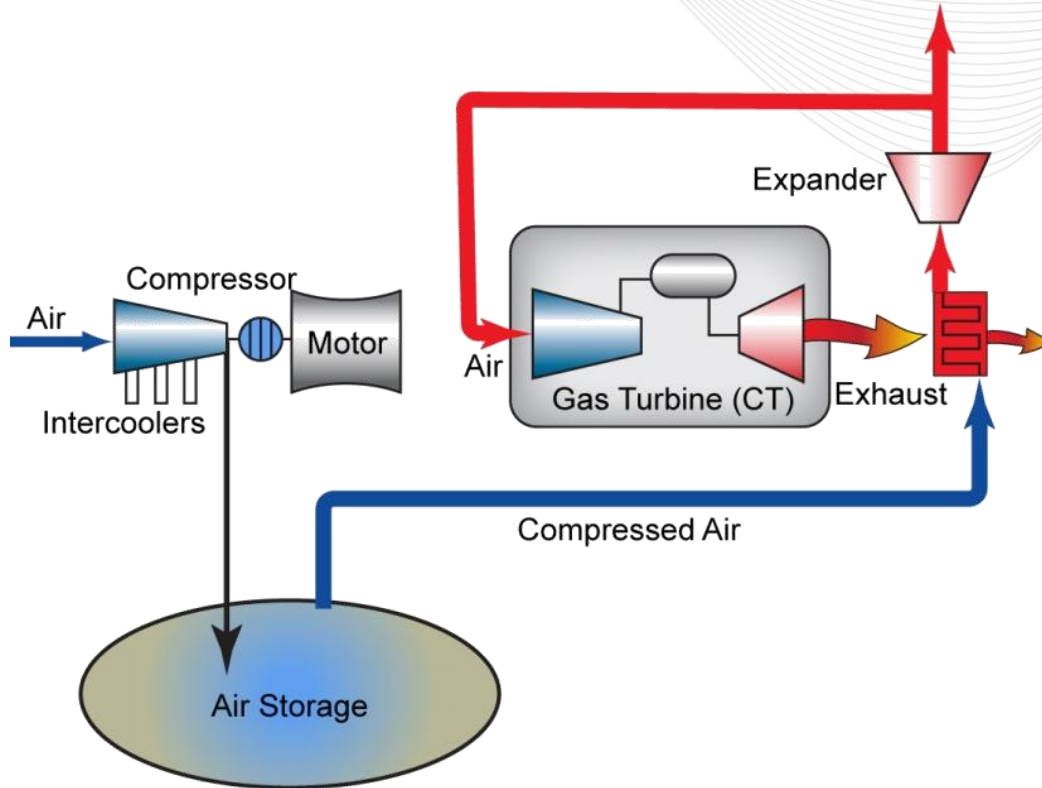
We have built 22,000 MW in the U.S.



Smart
Grid



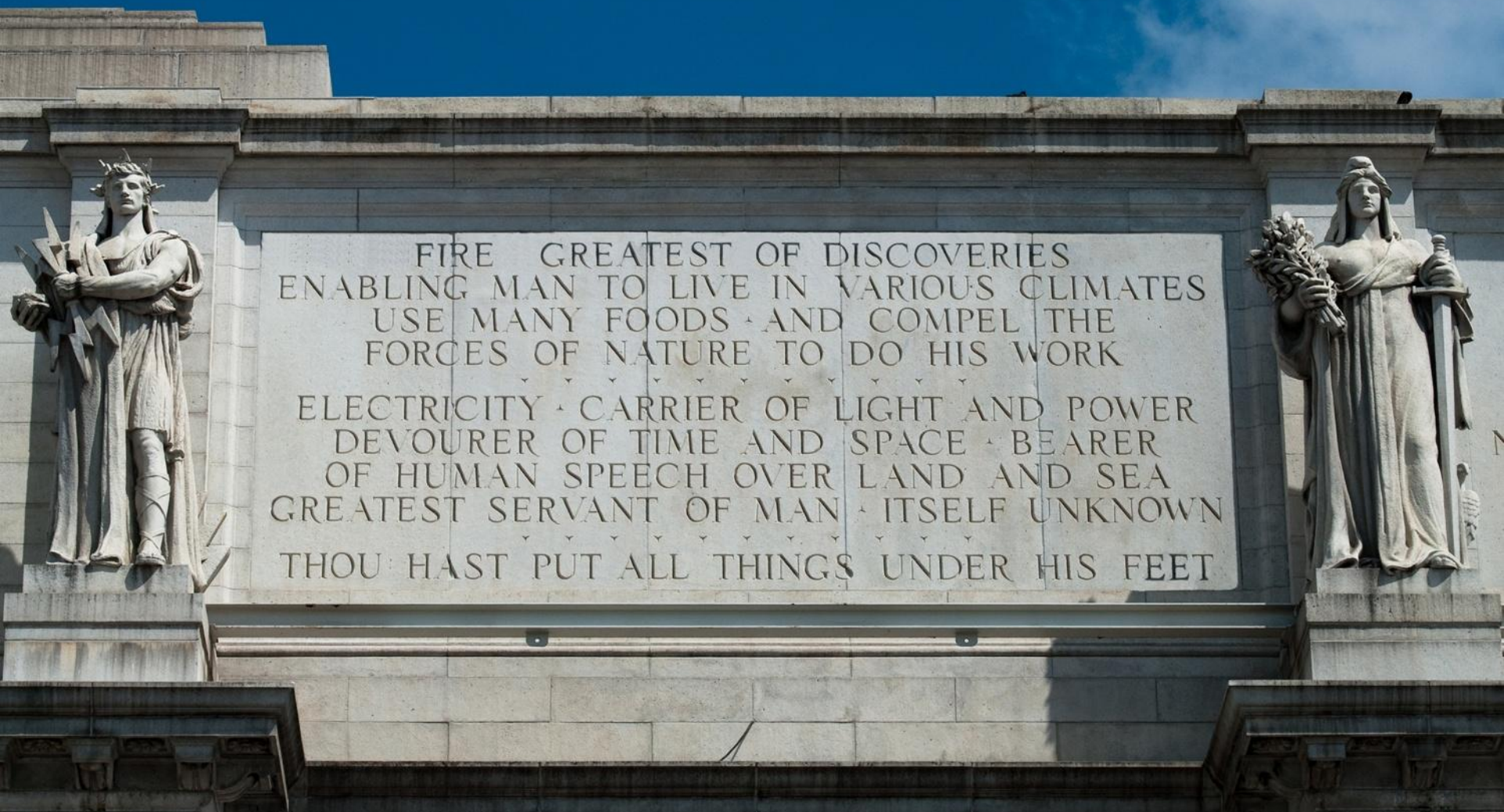
← 80+
gallon
tank



PowerSouth Cooperative (formally Alabama Electric Cooperative) Compressed Air Energy Storage Plant (110 MW - 26 Hour Discharge Capability)

West Philly High School: EVX GT Plug-In Parallel Hybrid Electric Vehicle





FIRE GREATEST OF DISCOVERIES
ENABLING MAN TO LIVE IN VARIOUS CLIMATES
USE MANY FOODS AND COMPEL THE
FORCES OF NATURE TO DO HIS WORK
ELECTRICITY CARRIER OF LIGHT AND POWER
DEVOURER OF TIME AND SPACE BEARER
OF HUMAN SPEECH OVER LAND AND SEA
GREATEST SERVANT OF MAN ITSELF UNKNOWN
THOU HAST PUT ALL THINGS UNDER HIS FEET