



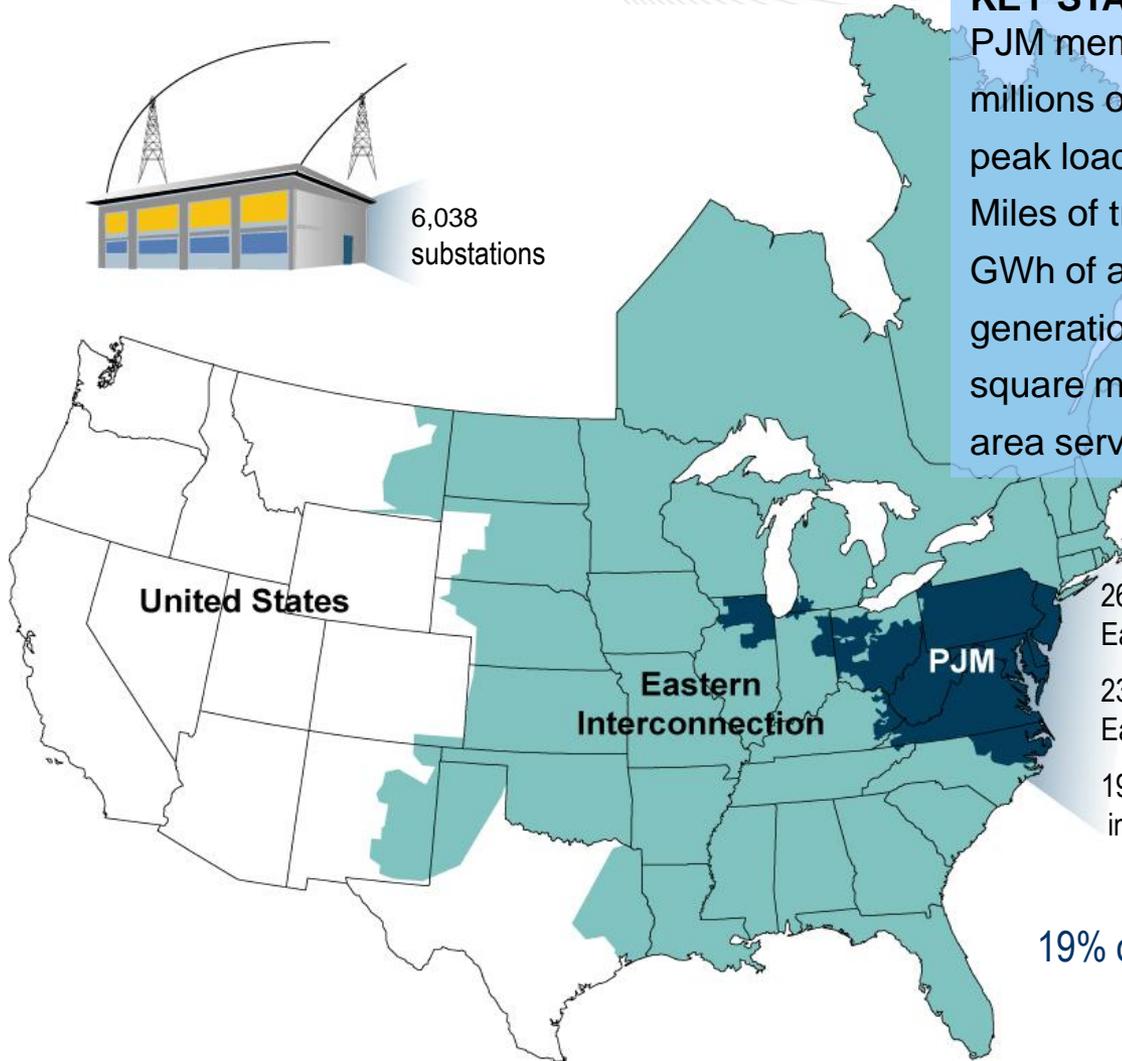
# PJM Summer 2009 Reliability Assessment

**Indiana Utility Regulatory Commission**

**May 12, 2009**



6,038  
substations



<b>KEY STATISTICS</b>	
PJM member companies	550+
millions of people served	51
peak load in megawatts	144,644
Miles of transmission lines	56,350
GWh of annual energy generation sources	758,832
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

## 2009

Forecast Load (MW) total	Load Mgt and Contractually Interruptible (MW)	Forecast Load (MW) Less Load Mgmt & Contractually Interruptible	Installed Generation Capacity (MW)	Reserve (MW)	Capacity Margin	Reserve Margin	Required Reserve Margin
134,430	5,925 (est.)*	128,505	165,200	36,695	22.2%	28.6%	15.0%

## 2008

Forecast Load (MW) total	Load Mgt and Contractually Interruptible (MW)	Forecast Load (MW) Less Load Mgmt & Contractually Interruptible	Installed Generation Capacity (MW)	Reserve (MW)	Capacity Margin	Reserve Margin	Required Reserve Margin
137,950	4,460 (est.)	133,490	165,300	31,810	19.2%	23.8%	15.0%

\* Still coming in for summer operations

# Glossary for Load and Capacity Comparison Slide

**Forecast Load** – Expected peak demand, based on normal weather (Total Internal Demand-TID)

**Load Management and Contractually Interruptible** – Demand Response and other customer load willing to be interrupted

**Forecast Load Less Load Management** – Expected peak demand after demand response has been implemented (Net Internal Demand-NID)

**Installed Generation Capacity** – Total MW output of all of the generators within the PJM Balancing Area (Installed Capacity—ICAP)

**Reserve (MW)** – Installed Generation Capacity minus Net Internal Demand

**Capacity Margin (%)** -- Reserve expressed as a percent of Installed Capacity

**Reserve Margin (%)** – Reserve expressed as a percent of Net Internal Demand

**Required Reserve Margin (%)** – PJM required planning reserve, as determined by the RPM process (Installed Reserve Margin-IRM)

# Summer Overview with Summer Operations Forecast

## 2008 Summer Forecast Outlook

Forecast Load (MW) total	Load Mgt and Contractually Interruptible (MW)	Forecast Load (MW) Less Load Mgmt & Contractually Interruptible	Installed Generation Capacity (MW)	Reserve (MW)	Capacity Margin	Reserve Margin	Required Reserve Margin
137,950	4,460 (est.)	133,490	165,300	31,810	19%	24%	15%

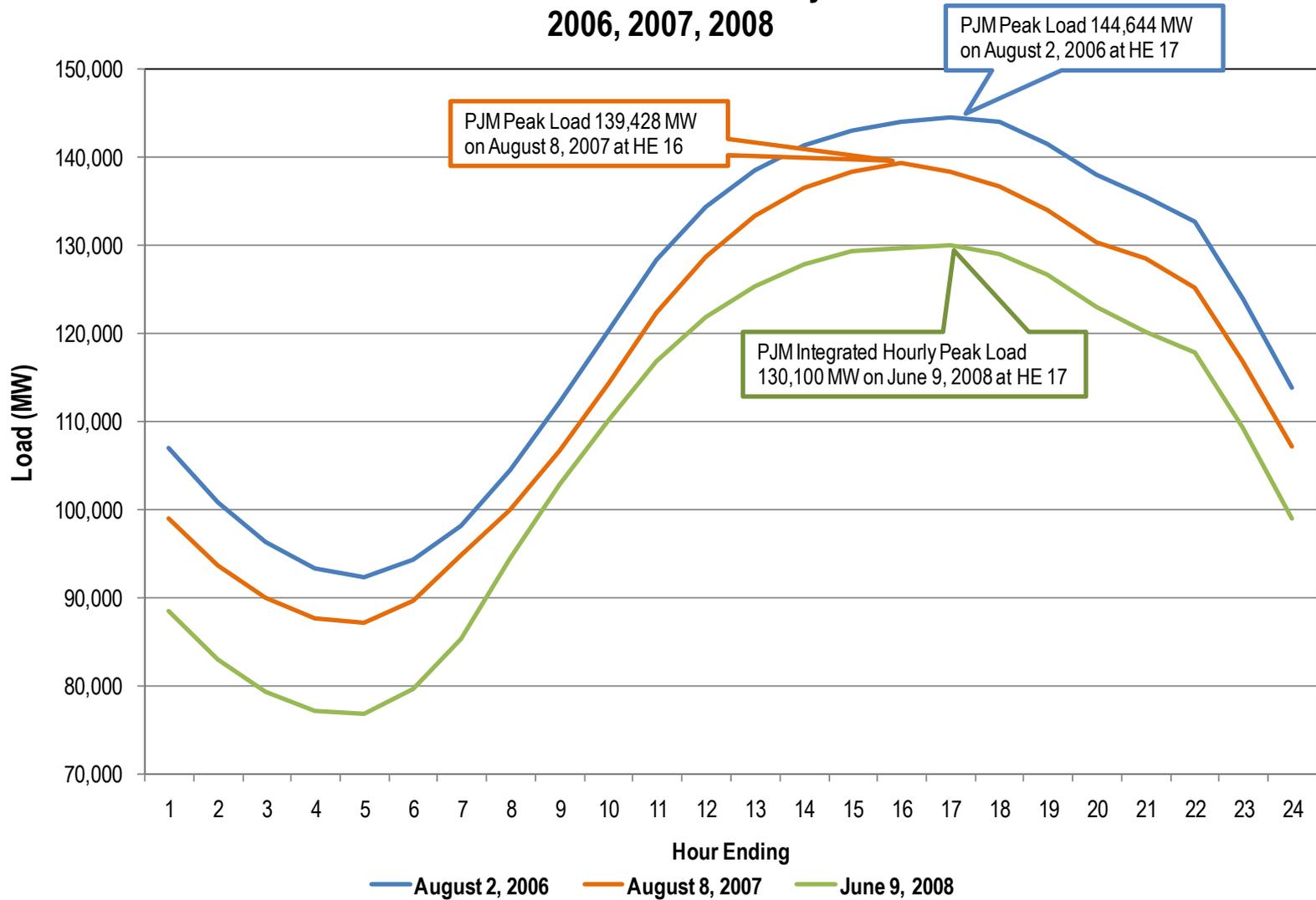
## 2008 Summer Peak Experience

Hour Ending	Date	Operational Metric Forecast	Integrated Real Time Peak Load	Installed Generation Capacity (MW)
17	9-Jun-08	131,021	130,100	166,020
17	17-Jul-08	131,705	129,479	166,020
17	1-Aug-08	125,646	124,854	166,020

## Normal Sequence of Emergency Procedures

- Alerts – Usually, issued the day before the operating day
- Warnings – Usually, issued the morning of the operating day or when the event is imminent
- Actions – At the onset of the event

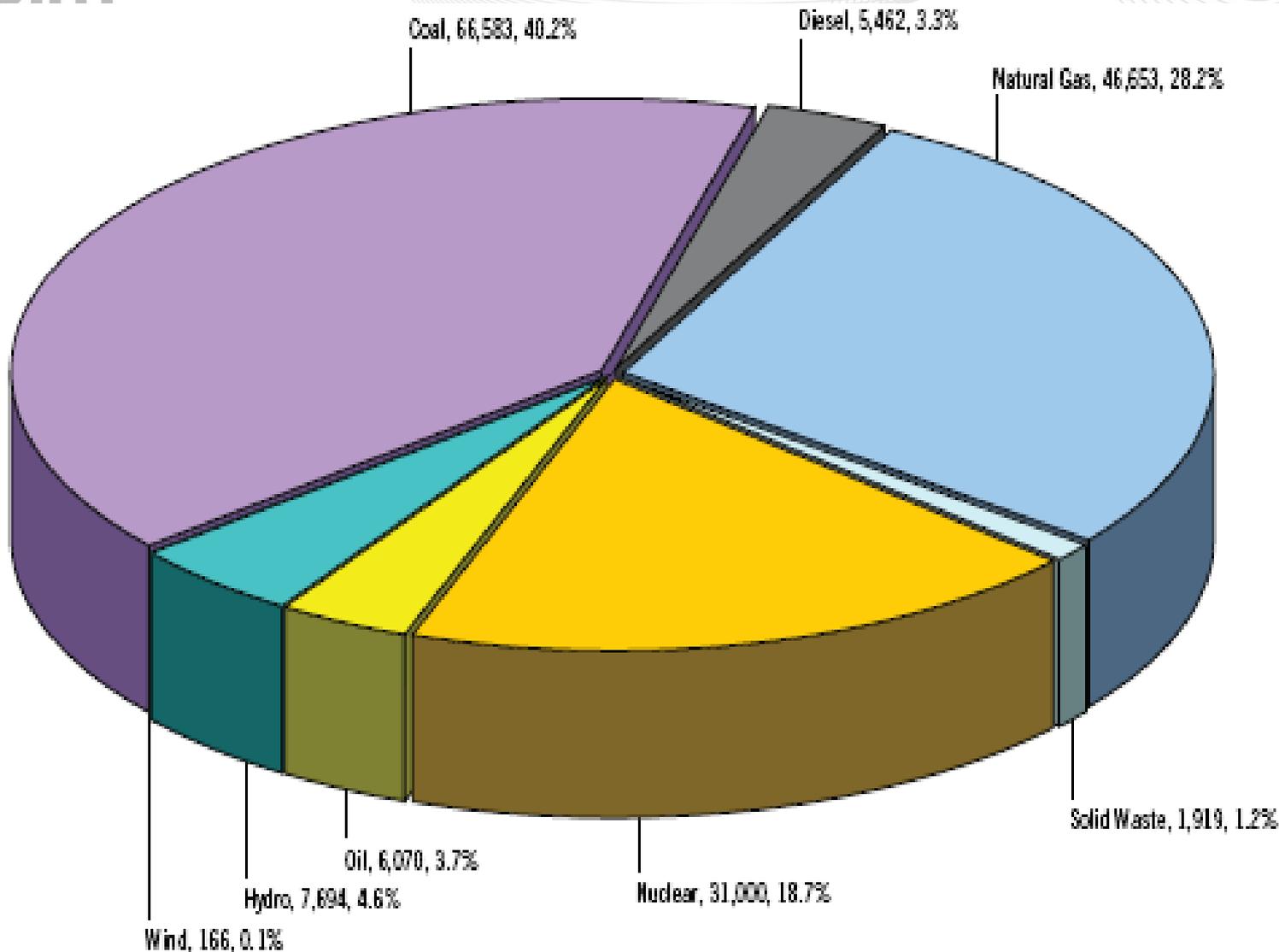
## PJM RTO Peak Load Days 2006, 2007, 2008



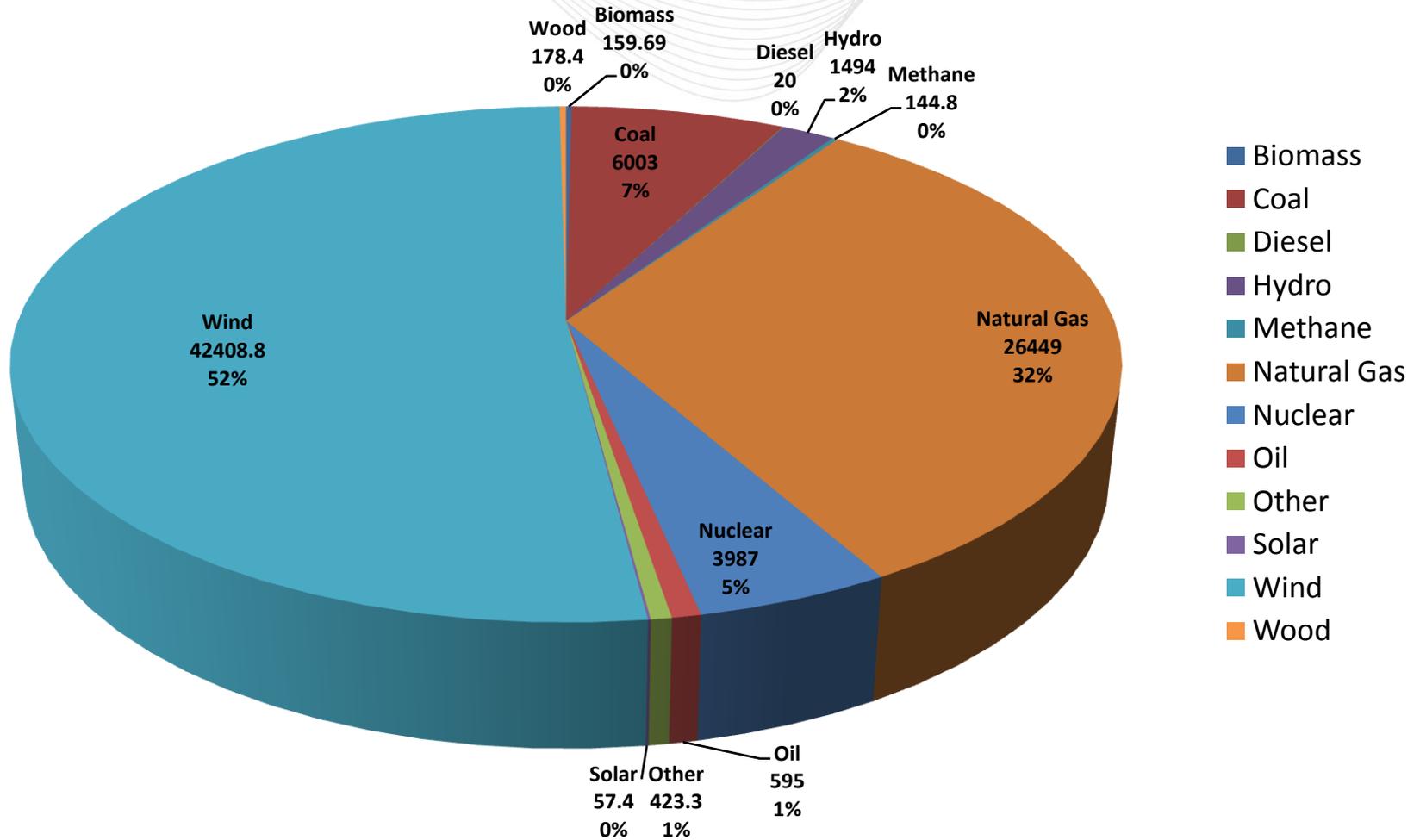
- **Hot Weather Alert** – 6/8 09:30 – 6/8 19:52 (for RTO except for ComEd area)
- **H1 advisory issued** – 6/8 09:45 - 6/8 19:45
- **Max Emergency Gen Alert** – 6/8 13:00 – 6/9
- **NERC EEA 1 issued** – 6/8 13:00 - 6/9 19:45
- **No Scarcity Pricing declared for summer 2008**

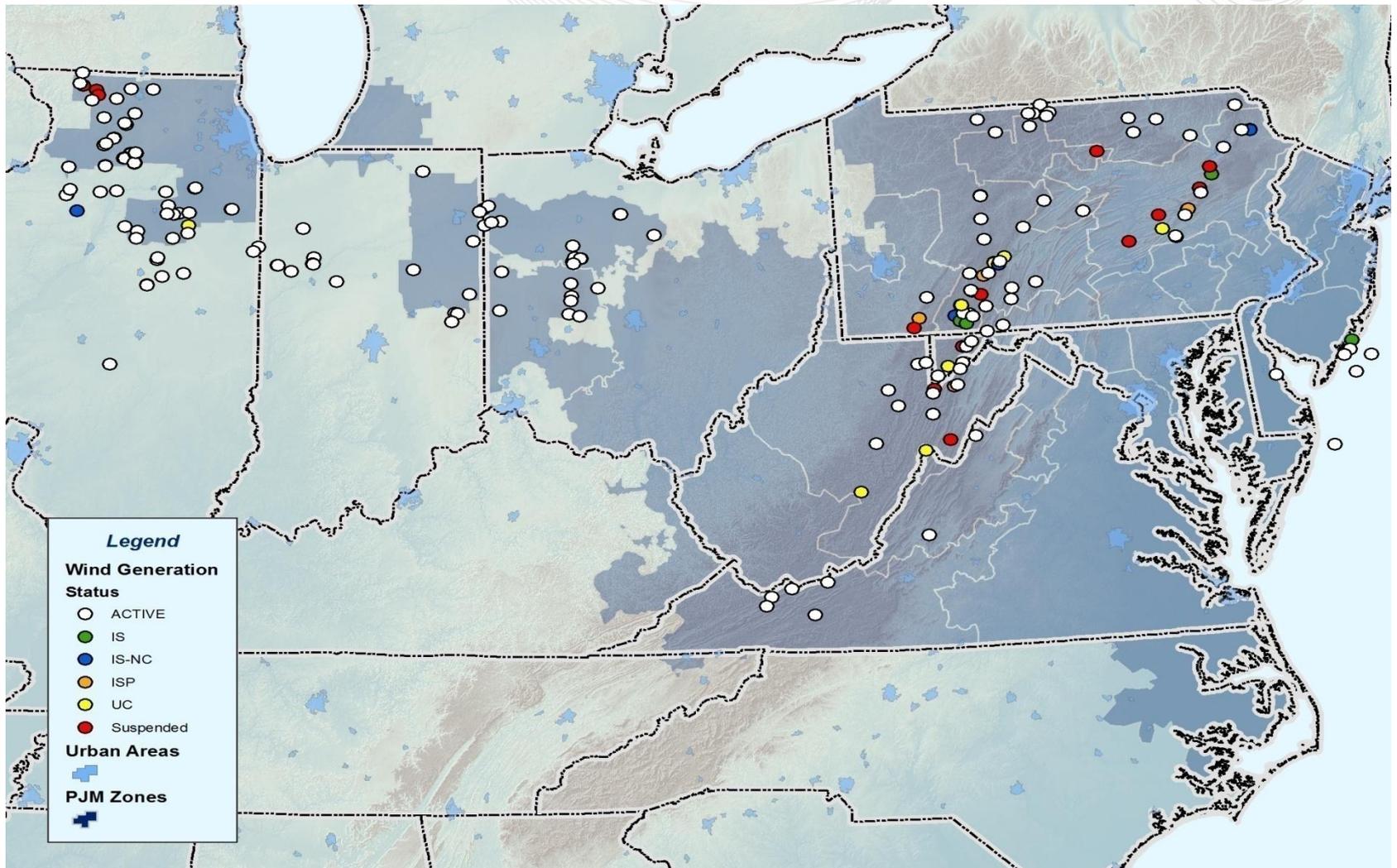
- PJM Operating Analysis Task Force (OATF) Summer Operating Study
- Reliability*First* Summer Assessment
- Joint Operations Coordination Meeting with PJM and MISO / NYISO / TVA / VACAR
- PJM Spring Operator Seminar (9 sessions – over 600 operators attended)
- PJM Emergency Procedures Drill

# Fuel Mix of Existing Installed Generating Capacity (through 12/31/08)

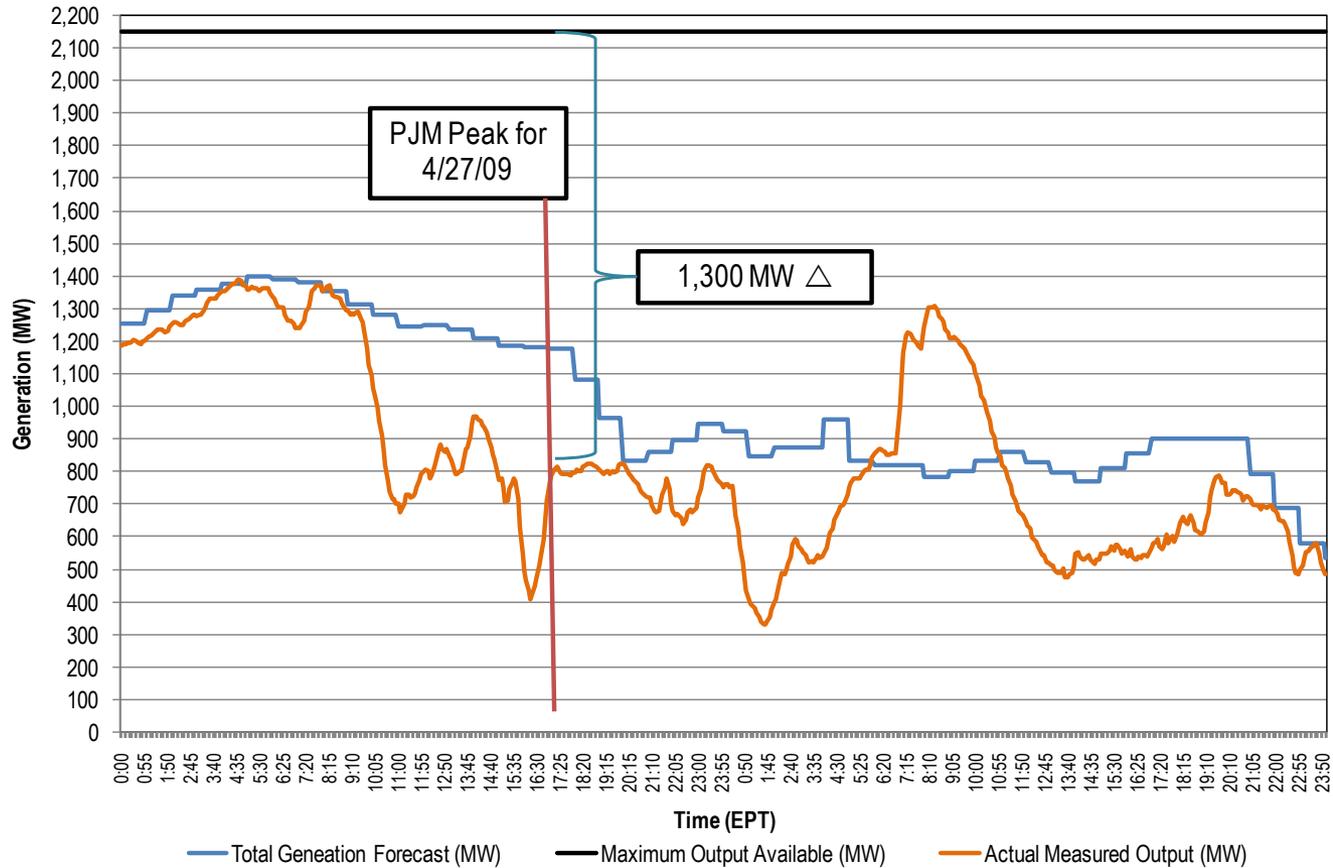


# Projects Listed as Active in the Queue



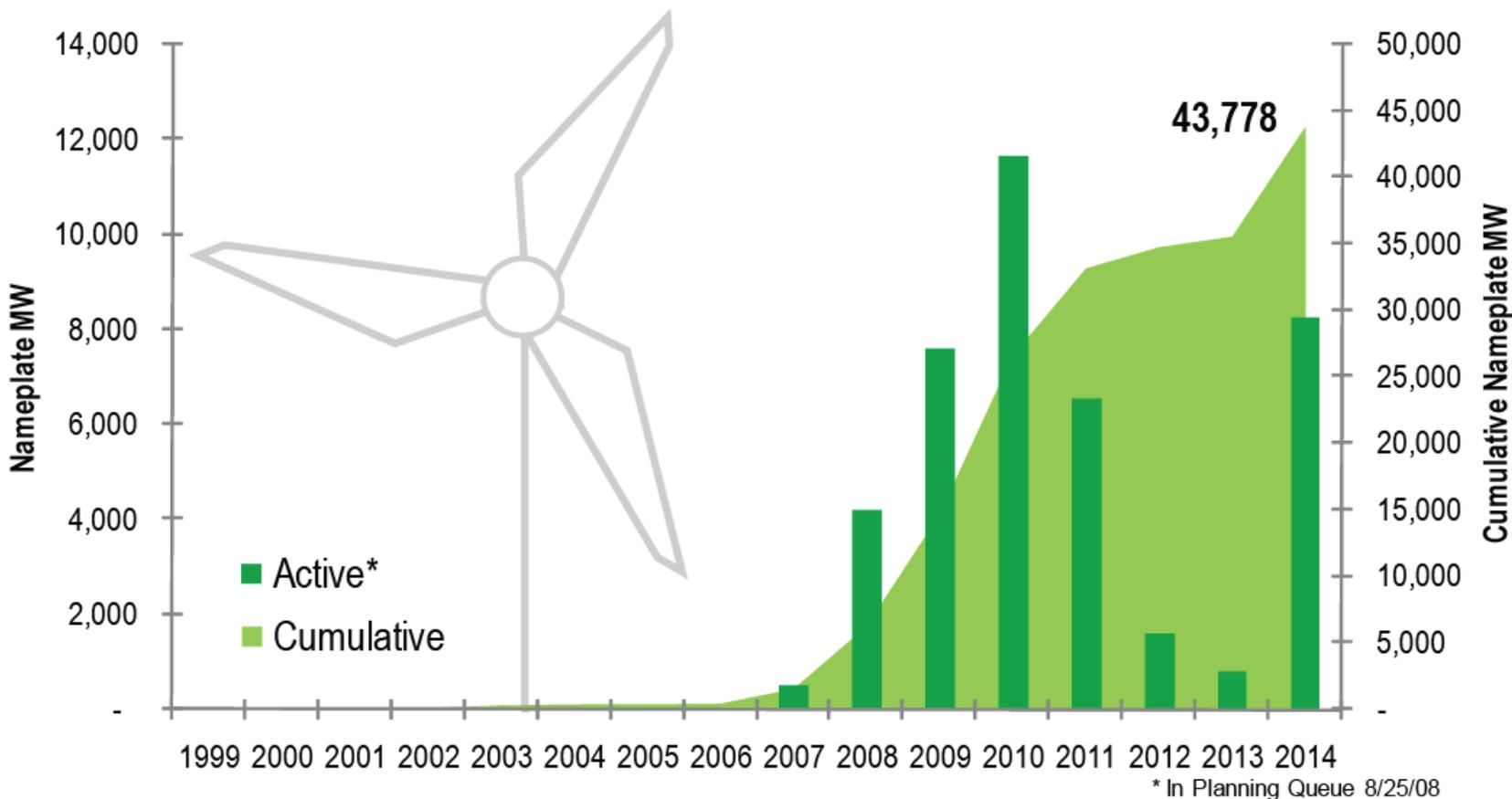


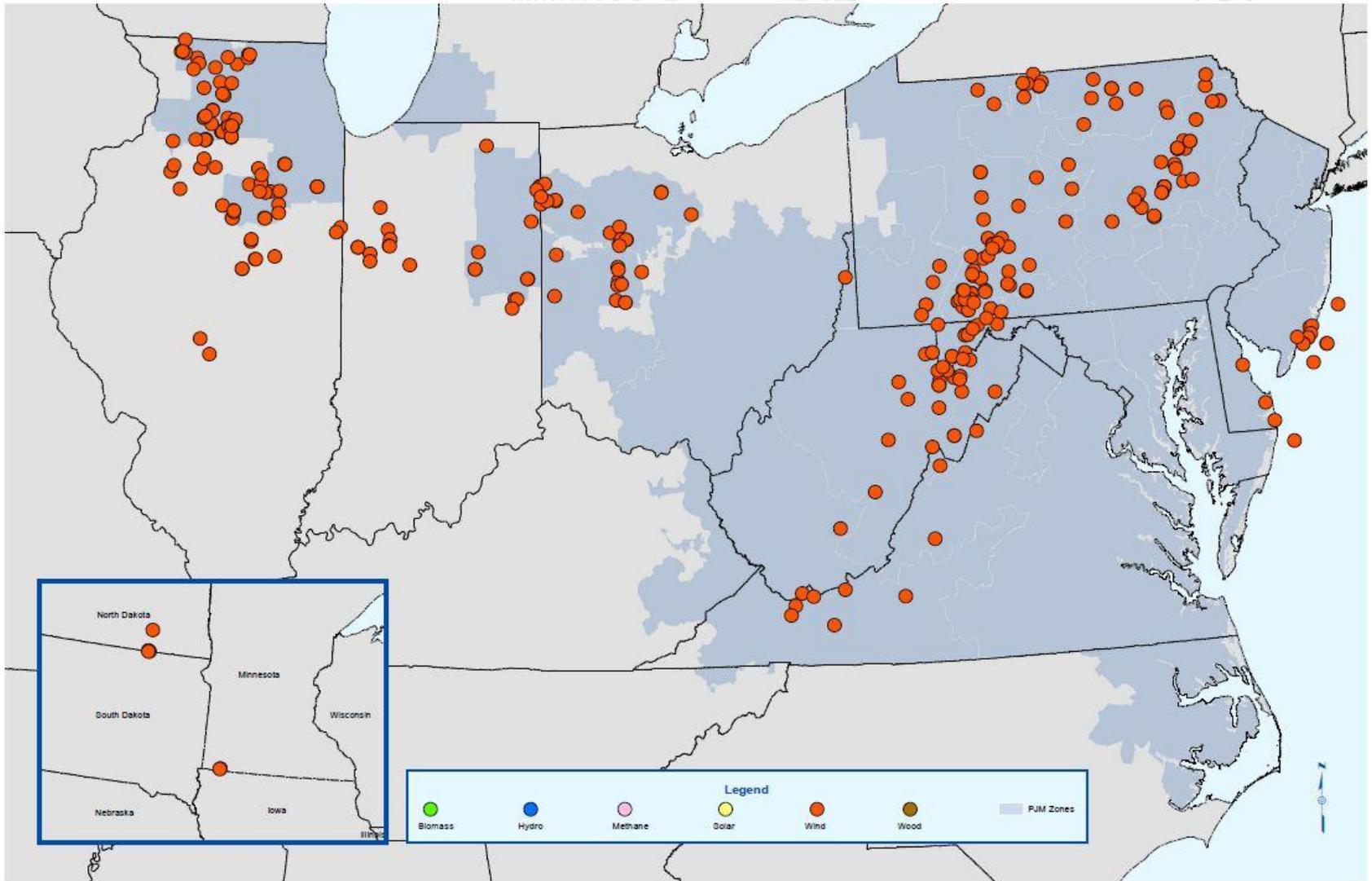
## PJM Wind Forecast April 27-28, 2009



- RTO Total Wind
- Forecast versus Actual
- 2 day period over PJM “Hot Weather Alert” Day

### Wind Generation in PJM Operational and Proposed





- Transmission costs and allocation are a circular discussion
  - Transmission requirements are estimated to be in the tens of billions of dollars (west-to-east)
  - Costs are assigned to generators in PJM tariff
  - Generation is in the queue now, transmission will take a long time to build
  - PJM market efficiency analysis will not build for hypothetical generation development
  - “Build it and they will come” approach requires a commitment to incur significant costs
    - Certainty required to support generation development and recovery of transmission investment
  - State and/or Federal mandates required to break log jam

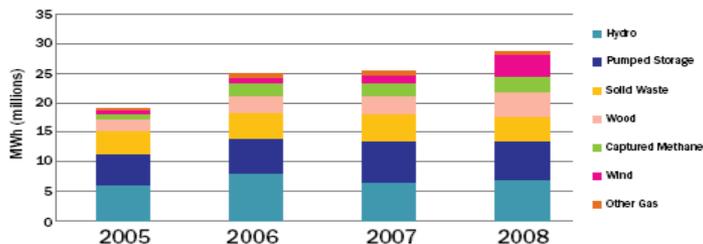
## Renewable Energy Dashboard

PJM studies proposed generation projects to determine what is required to connect them to the grid. The process entails three major interconnection studies and the completion of several milestones before a generating plant is deemed "in-service." At any point, a developer can withdraw the project.

### Generation Portfolio Today

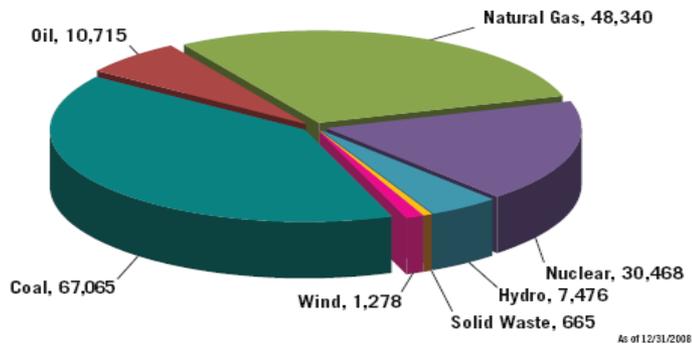
#### Renewable Energy in PJM

This chart shows megawatt-hours of renewable energy by fuel source produced in PJM for each year since tracking began in late 2005. Renewable generation is growing, however, it represents a small part of the generation mix. In 2008, renewable energy comprised only four percent of the total generation.



#### PJM Capacity by Fuel Source (MW)

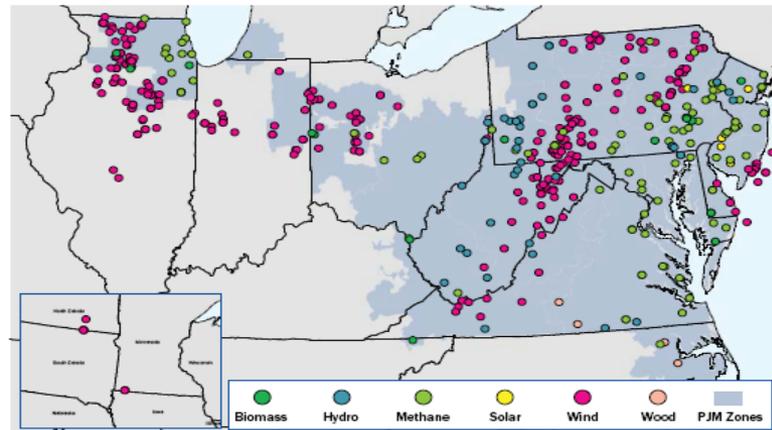
The types of generation that make up the approximately 165,000 megawatts available in the PJM region.



PJM ©2009

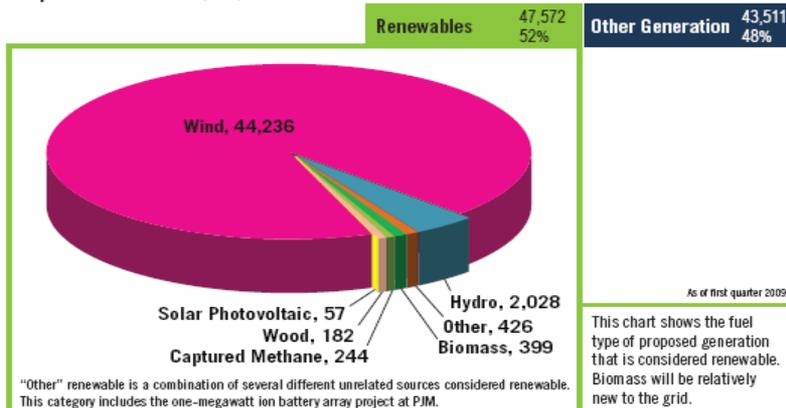
### Tomorrow...

#### Proposed Renewable Generation in PJM



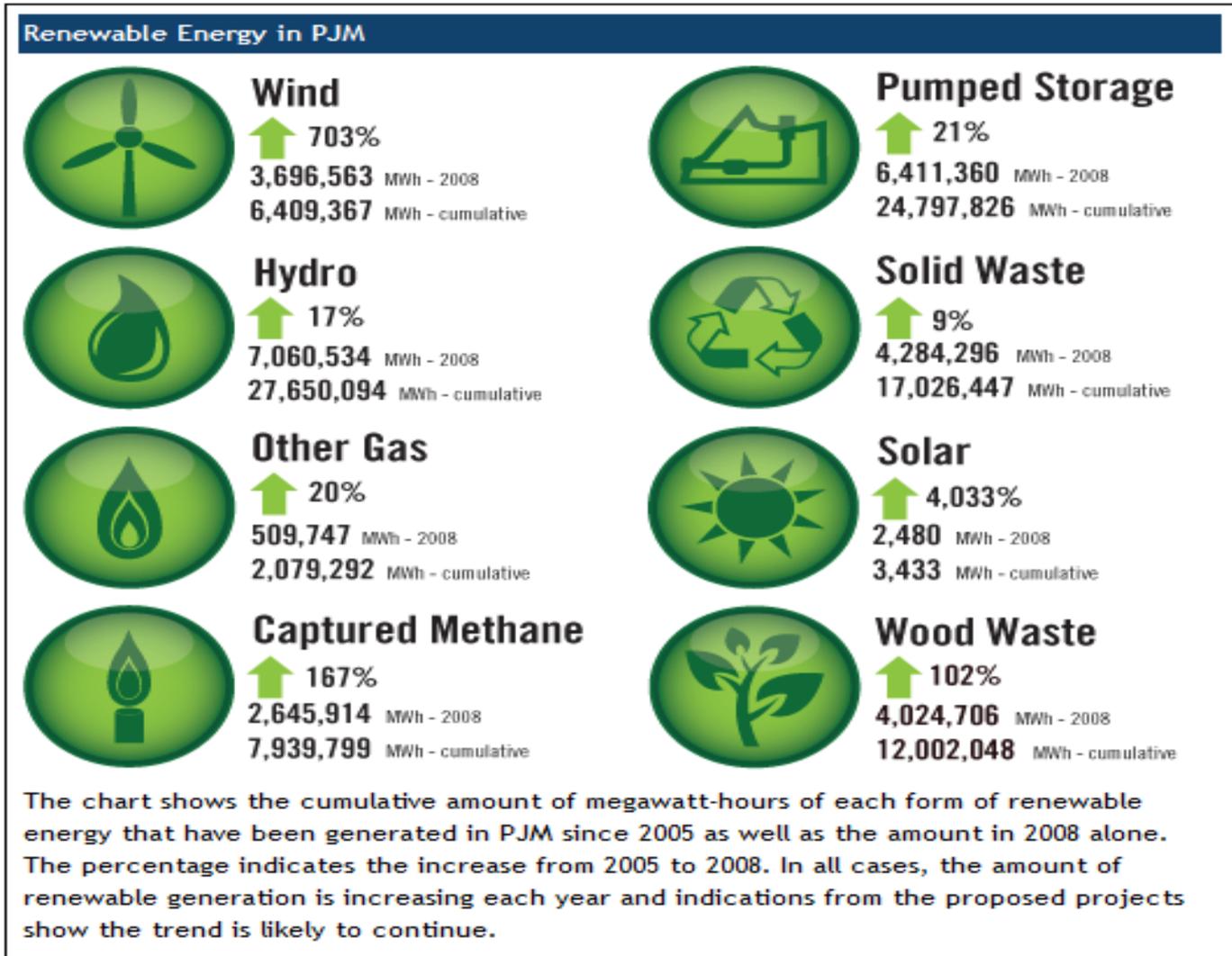
This map shows where renewable generation projects are proposed, including generation outside of PJM's footprint, which will trade in PJM's market.

#### Proposed Generation (MW)



"Other" renewable is a combination of several different unrelated sources considered renewable. This category includes the one-megawatt ion battery array project at PJM.

This chart shows the fuel type of proposed generation that is considered renewable. Biomass will be relatively new to the grid.



<http://www.pjm.com/about-pjm/newsroom/renewable-dashboard.aspx>

- PJM expects to be able to reliably serve expected peak loads
- Western PJM system continues to be accessible for import transactions, if necessary. Assuming no unusual events, PJM does not anticipate any problems
- PJM can transmit energy from Eastern PJM to Western PJM and to MISO, if necessary