

# Smart Grid Technical And Policy Challenges

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September 16, 2009  
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<http://www.nema.org/smartgrid>

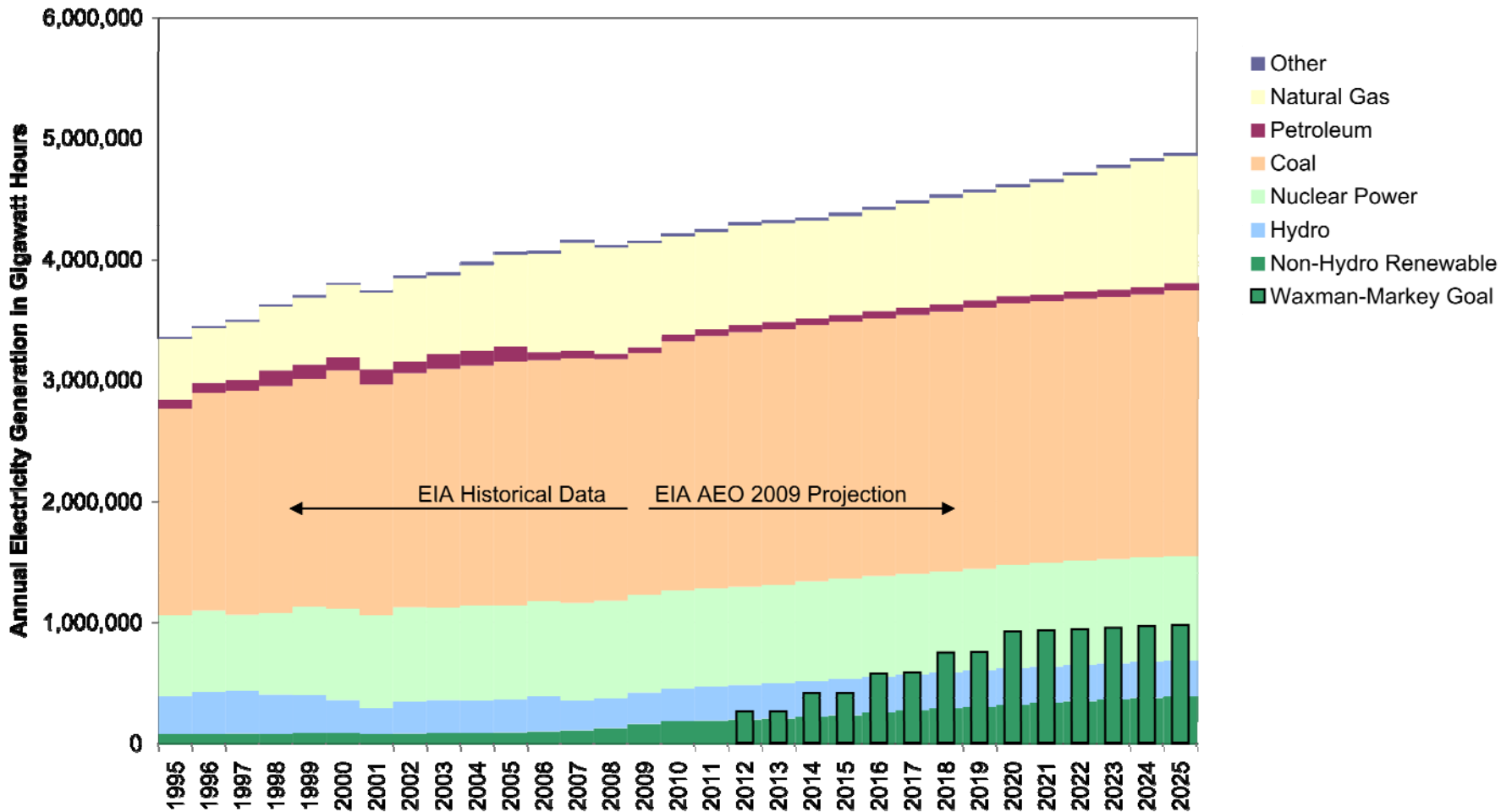
# Smart Grid: From Generation to Consumption



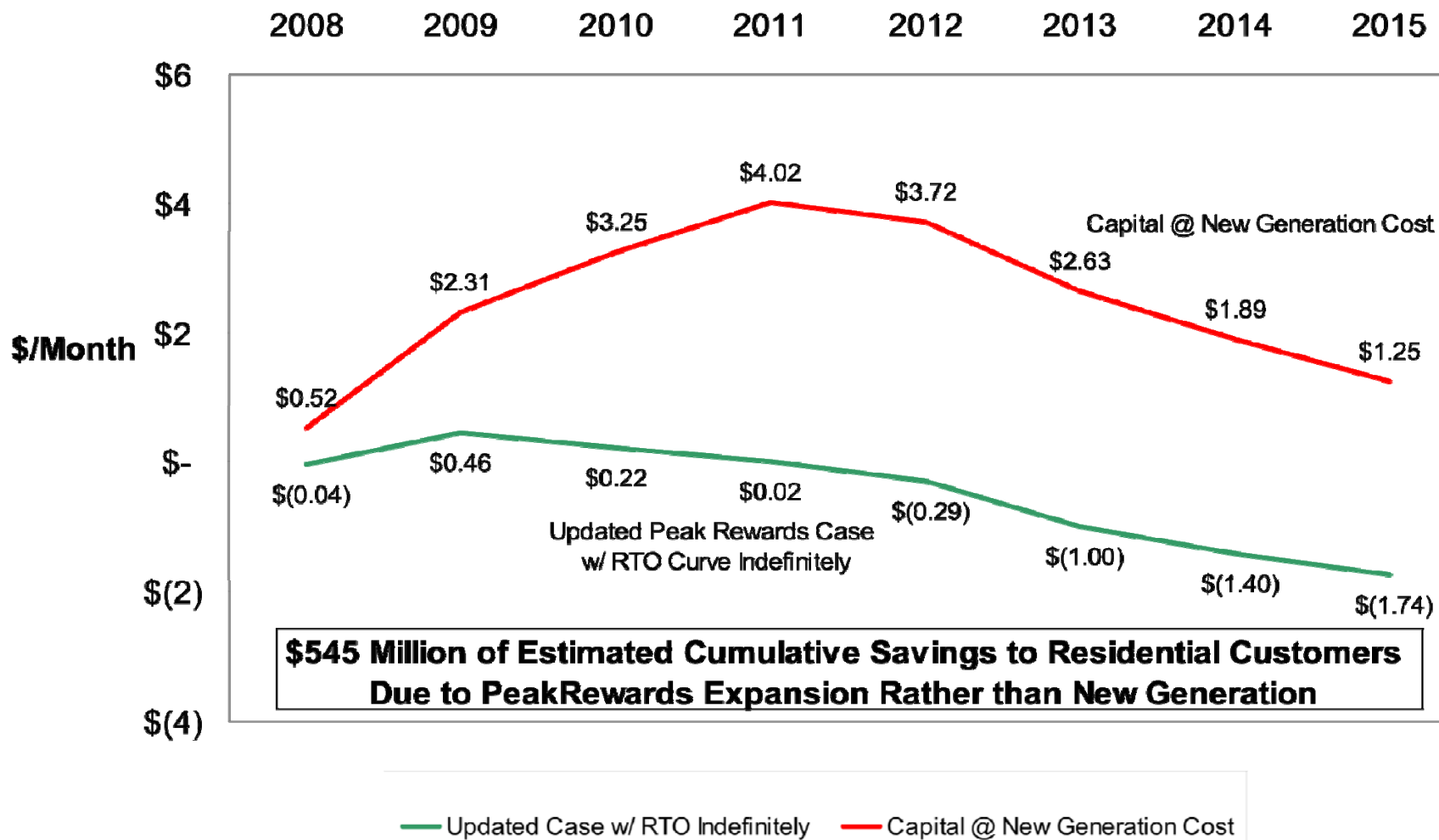
# Policy Drivers for the Smart Grid

- 💡 **Climate - Low carbon energy**
  - Waxman-Markey Renewable Energy Standard
- 💡 **Economy - Hold down costs**
  - BG&E Peak Rewards Program
- 💡 **Security and Reliability**
  - Visualization of 2003 Northeast Blackout

## Historic and Projected US Electricity Generation by Source Compared to Waxman-Markey Requirement



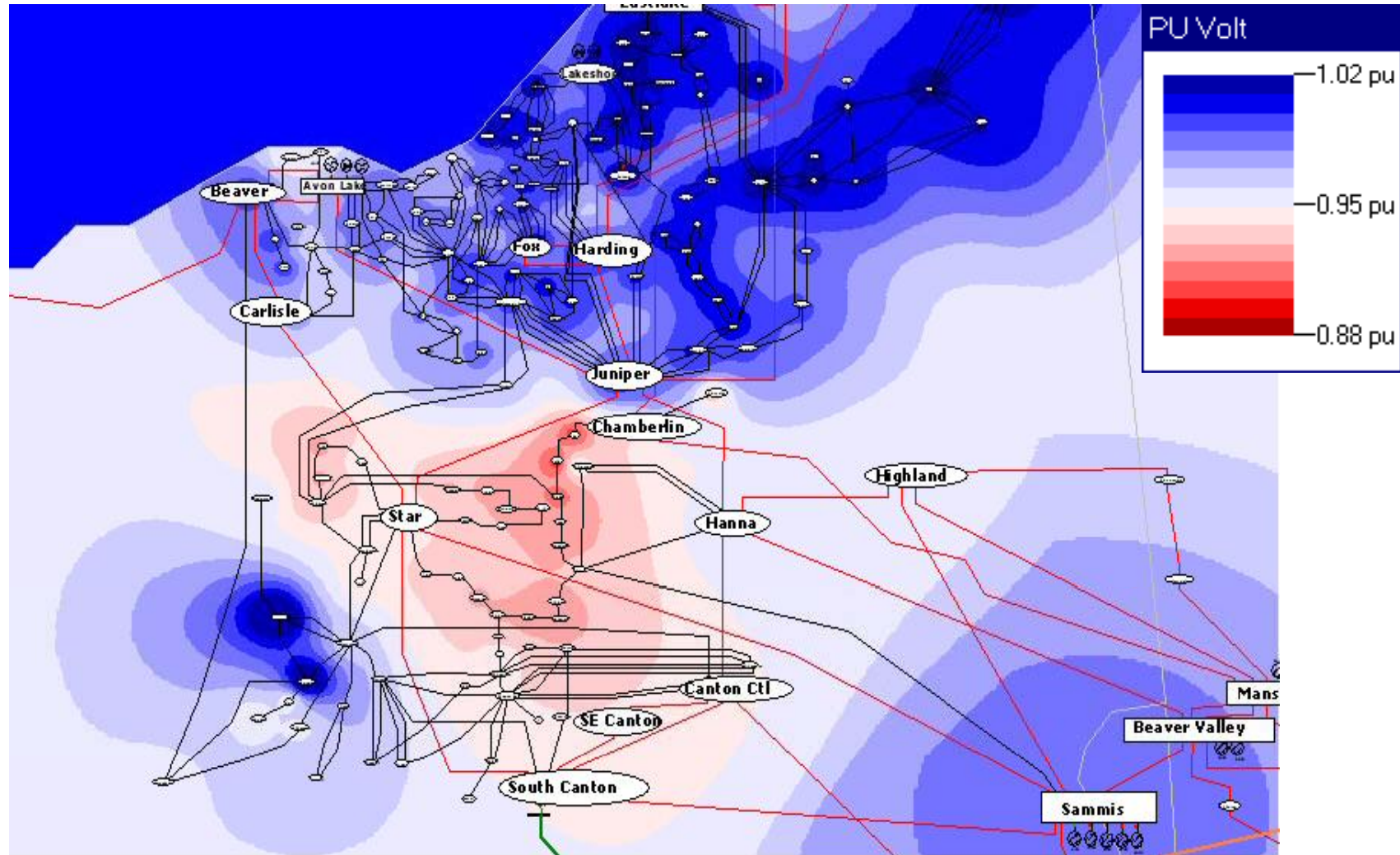
## PeakRewards vs. New Generation Bill Impact



Source: Wayne Harbaugh, "BGE Smart Energy Savers Program, Presentation to the PJM Symposium on DR," May 12, 2008

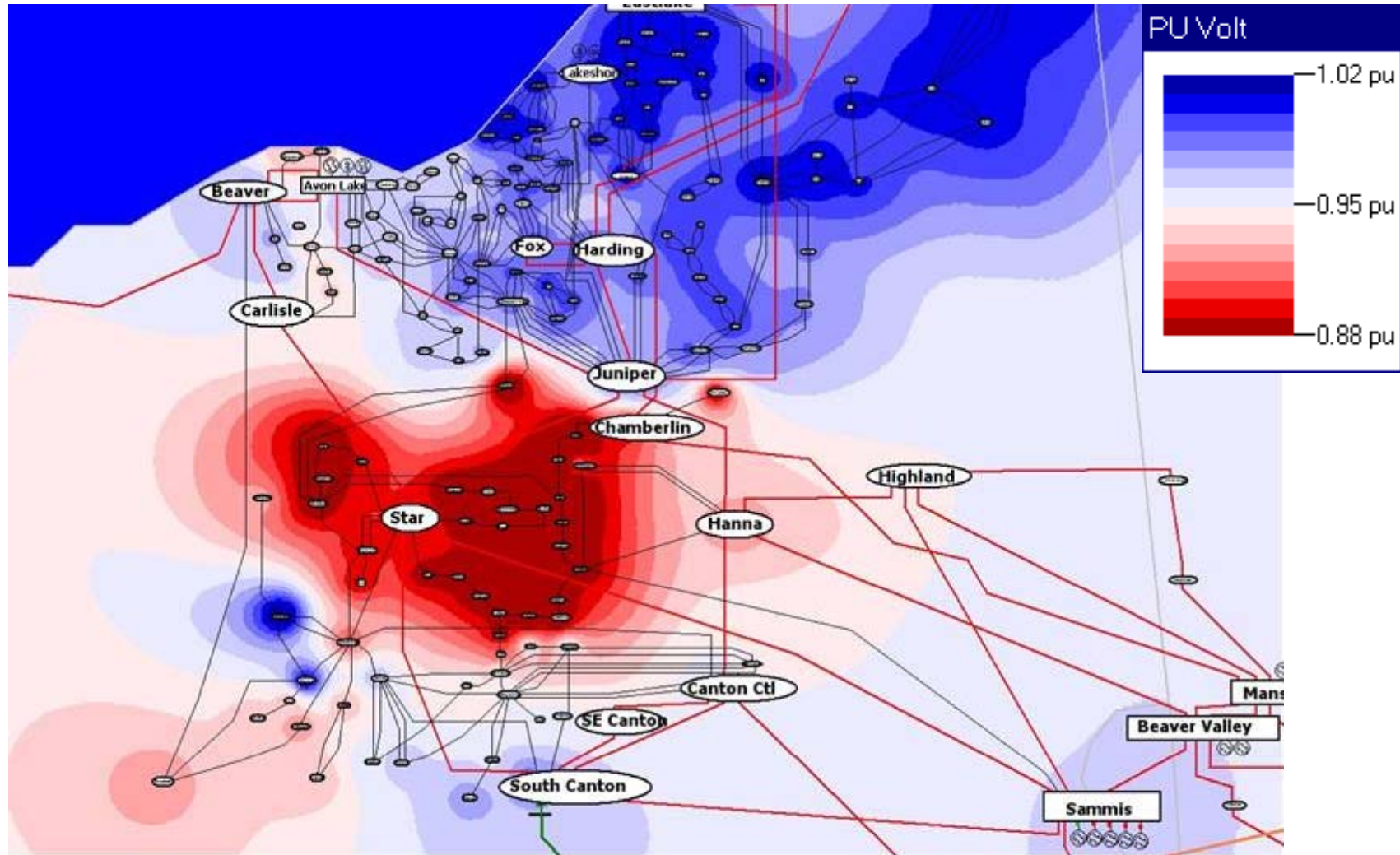


## Northeast Ohio 138 kV Voltage Contour: 15:33 EDT



Source: Tom Overbye, "Power System Control: Enhancing the Human-Machine Interface," March 13, 2004

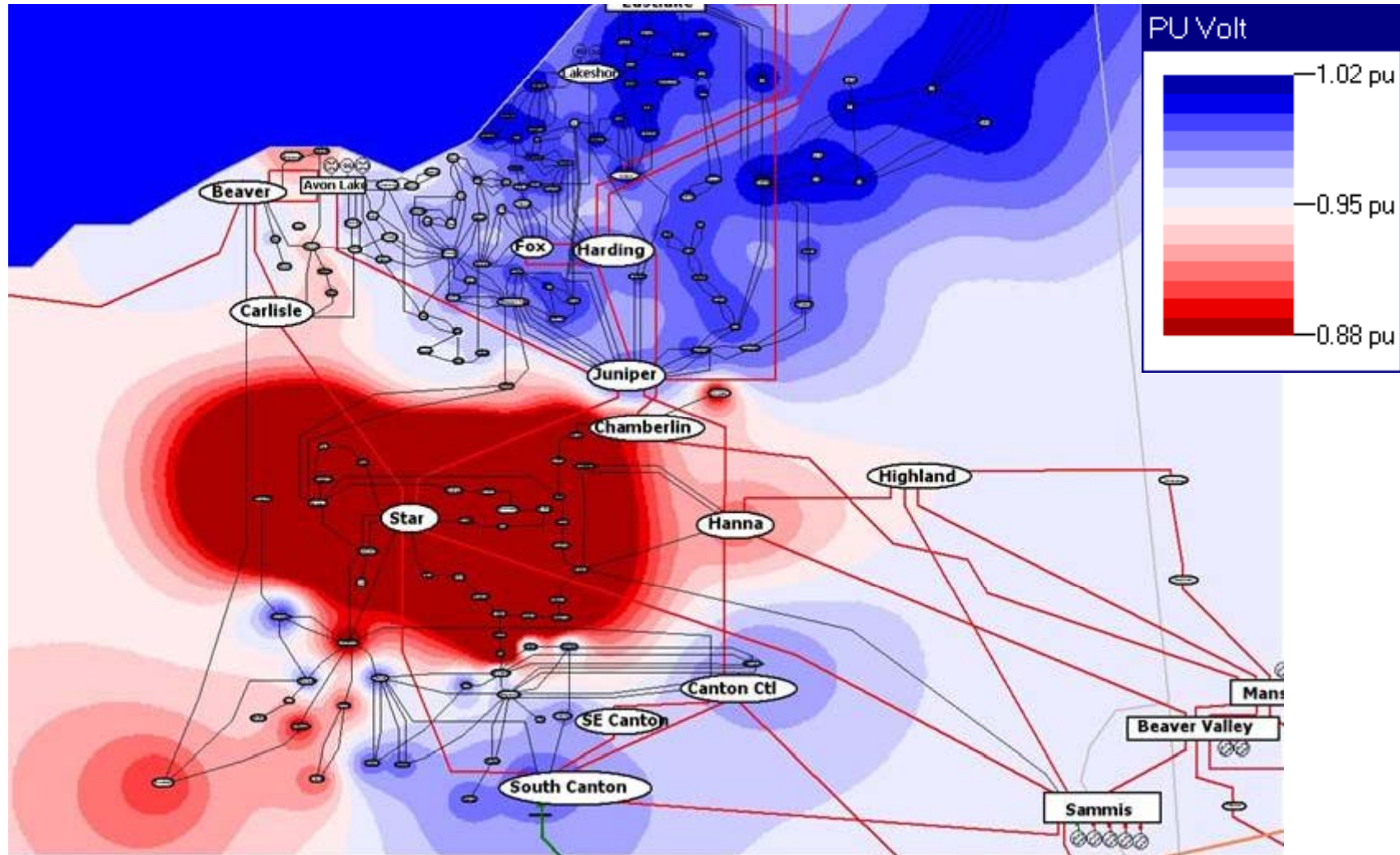
## Northeast Ohio 138 kV Voltage Contour: 15:46 EDT



Source: Tom Overbye, "Power System Control: Enhancing the Human-Machine Interface," March 13, 2004



## Northeast Ohio 138 kV Voltage Contour: 16:05 EDT



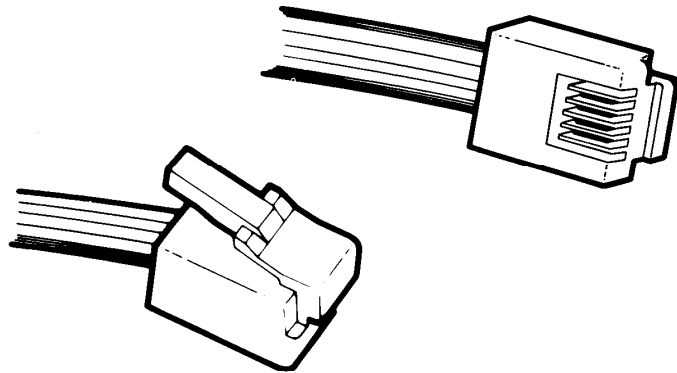
Source: Tom Overbye, "Power System Control: Enhancing the Human-Machine Interface," March 13, 2004



# NIST Priority Standards Areas

	NIST Priority Action Plan	Climate	Economics	Reliability
1	Role of IP in the Smart Grid		X	
2	Wireless Communications for the Smart Grid		X	
3	Common Price Communication Model		X	
4	Common Scheduling Mechanism	X	X	
5	Standard Meter Data Profiles		X	
6	Common Semantic Model for Meter Data Tables		X	
7	Electric Storage Interconnection Guidelines	X		X
8	CIM for Distribution Grid Management	X		X
9	Standard DR Signals		X	
10	Standard Energy Usage Information	X	X	X
11	Common Object Models for Electric Transportation	X	X	
12	IEC 61850 Objects/DNP3 Mapping			X
13	Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization			X
14	Transmission and Distribution Power Systems Model Mapping			X

# Standards: Opportunities for SMEs



(Note: This plug is depicted equipped with 4 contacts; it may be fabricated with its full 6 contact capability.)

Figure 68.500(a)(1)(i)-View



## NEMA Members' Involvement in Smart Grid

- 💡 NEMA seeks to create platforms for innovations that improve grid performance
  - Standards Development
  - Policy Advocacy
  - Financial Incentives for Smart Grid Deployment



# Standards Development

- 💡 Goal: Nationwide, International Markets
- 💡 Determine Current and Future State of Industry
  - Protocol Survey Underway
  - “Vision” Document Drafted - **Levels of Intelligence**
- 💡 Assist NIST in Standards Framework
  - Help identify needs and work areas
  - Serve on NIST working groups
  - Make NEMA resources available
- 💡 Proactive outreach abroad
  - Workshop and roundtable in Beijing, March 2009

# Conclusion

- 💡 NEMA is committed to enabling the smart grid
  - Industry consensus for standards and protocols  
*(standards will create platforms for SMEs)*
  - Promote smart grid technologies as solutions to policy drivers
  - Provide financial incentives and remove barriers to deployment of new technologies